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MAR 1 8 1957

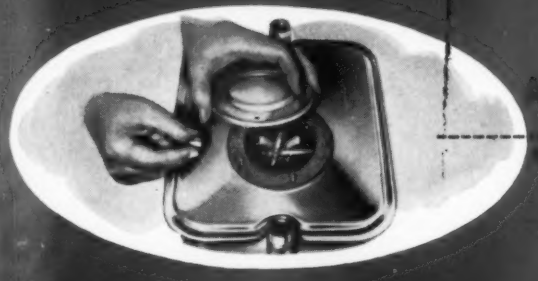
NINETY-EIGHTH YEAR

AMERICAN Gas Journal

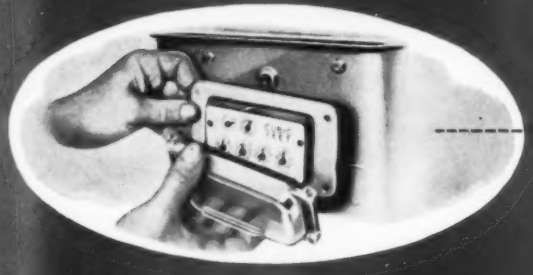
MARCH, 1957

Only Magazine Published Exclusively for the Gas Utility Industry

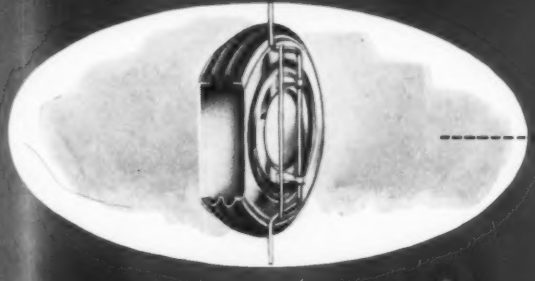
New Advanced Design AMERICAN® "W" Series Steelcase Meters



Ironcase-meter accessibility through easily opened handhole.



Interchangeable index—external and isolated from pressure with gas-tight frictionless rubber grommet drive-shaft seal.



Molded Duramic Diaphragms and Reinforced Flag Rods—provide trouble-free accurate service for entire meter life.

MODEL W-175

★ Light Weight, Welded Steelcase Construction
★ Proven Speed Ratio for "Sustained Accuracy"
★ Long Service Life at Lowest Maintenance Cost
★ New Lifetime Corrosion Protection Coatings

And every American meter refinement developed in 120 years of meter engineering.

The unusual advantages of this new series by American open entirely new possibilities in meter maintenance and retirement.

W-75 Rated Capacity 75cfh FOB Philadelphia, W-45-LPG* Rated Capacity 45cfh FOB Philadelphia, W-175 Rated Capacity 175cfh FOB Fullerton, Calif., W-210 Rated Capacity 210cfh FOB Philadelphia, W-250 Rated Capacity 250cfh FOB Philadelphia, W-300 Rated Capacity 300cfh FOB Philadelphia.

*Propane.

Rated capacities based on 0.64 sp. gr. gas at ½-inch pressure drop — 5 psi working pressure.

Consult your American Meter representative for full information.

AMERICAN® METER COMPANY
INCORPORATED (ESTABLISHED 1836)

AMERICAN METER CO EST. 1836 MEASUREMENT ENGINEERS

GENERAL SALES OFFICE: Somerton, Philadelphia 16, Penna. • Albany Alhambra • Atlanta • Baltimore • Birmingham • Boston • Chicago • Dallas • Denver • Erie • Houston • Kansas City • Los Angeles • Minneapolis • New York • Omaha • Pittsburgh • San Francisco • Seattle • Tulsa • Wynnewood • IN CANADA: Canadian Meter Company, Ltd., Milton, Ontario • Calgary • Edmonton • Regina

TO THE GAS INDUSTRY for Ironcase, Tinned Steelcase, Aluminumcase and Welded Steelcase Meters • American-Westcott Orifice Meters • Instruments • Reliance Regulators • Apparatus • Valves

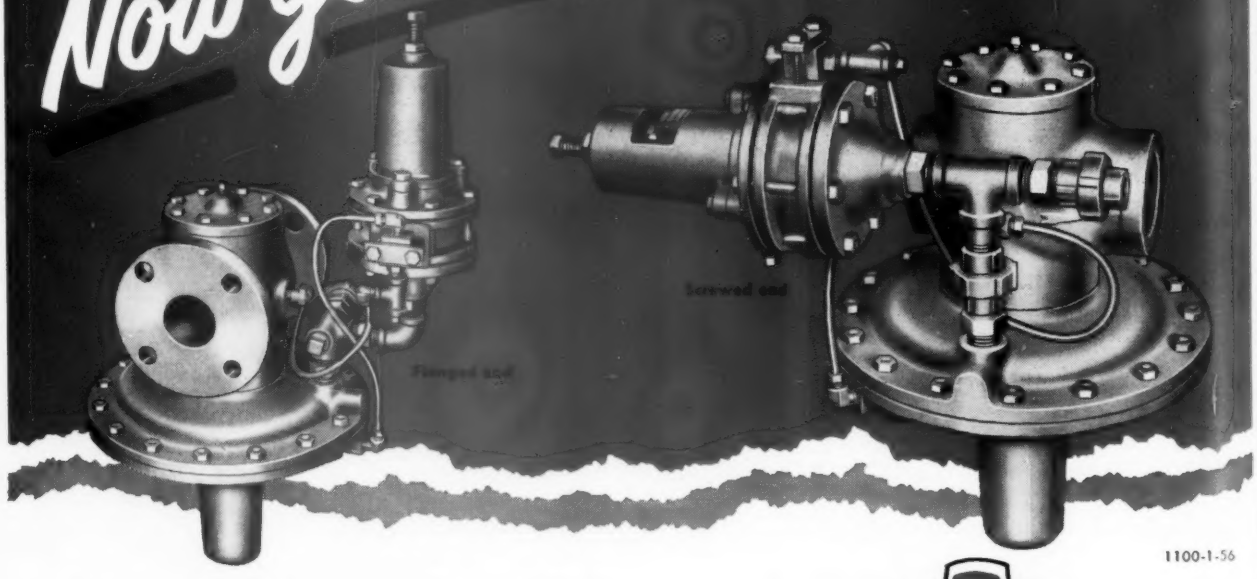
LINE PRESSURE GOING UP!

MEMO
FROM THE OFFICE OF THE PRESIDENT

Geo:— Considering raising line pressure Better check this— Now good up to 400 psi Rehm.

Chaplin-Fulton '1100' REGULATOR

Now good up to 400 psi



1100-1-56

Now, more versatile than ever—good up to 400 psi. Your choice of three body assemblies—

2″ flanged 250 lb.	rated for 400 psi
2″ screwed end	rated for 400 psi
2″ flanged 125 lb.	rated for 175 psi

All suitable for outlet pressure range from ounces to 150 psi with no change required in regulator or pilot—just change the pilot spring. It's accurate—versatile—compact! A good buy!

Why stock two, when Model '1100' will do?

And, if 400 psi is too low, why not try the all-steel Model '1200', good up to 1200 psi inlet and 600 psi outlet?

Full information on request.

ACCURATE CF MFG. CO. DEPENDABLE

Chaplin-Fulton

MANUFACTURING COMPANY

Pittsburgh 25, Pennsylvania

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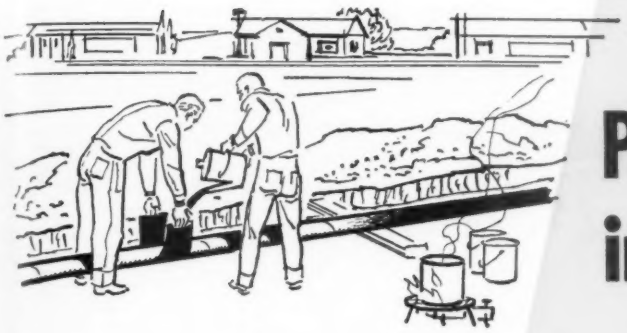
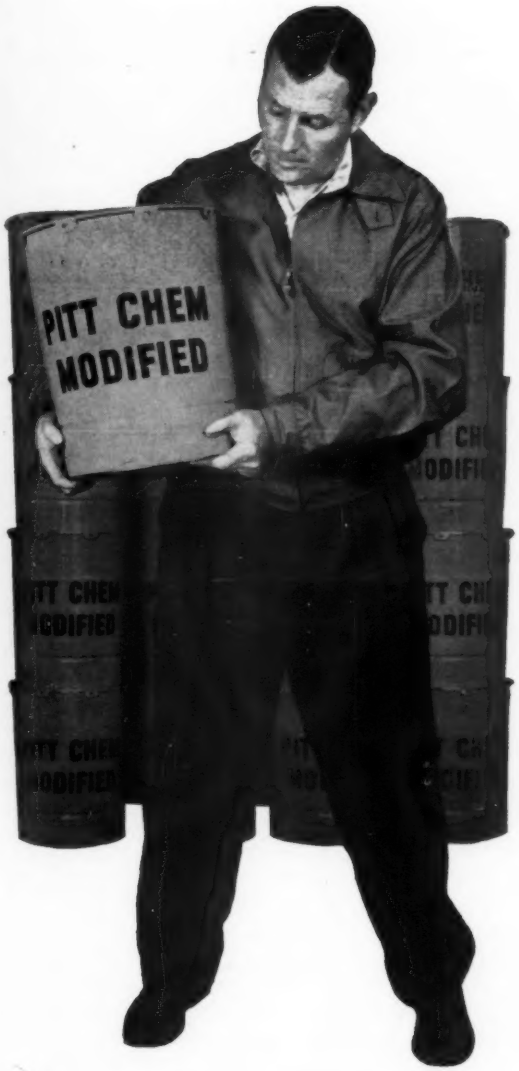


NOW!

PITT CHEM Enamel in 75 lb. Containers!



PITT CHEM® TAR BASE ENAMELS

- Standard Grade • Modified Grade
- Plasticized Grade • Hotline
- Cold Applied Tar Base Coatings

For Easier Handling and Economy When You Patch or Coat Joints of Mill Wrapped Pipe

You can now obtain popular Pitt Chem Modified and Plasticized Enamels in 75 lb. containers. That means plenty of work-saving, money-saving advantages when you patch or coat joints. For example:

- 75 lb. containers avoid waste—eliminate cutting up a full drum of enamel when there is need for only a small amount.
- Smaller containers permit use of smaller melting kettle. In congested work areas, reduces space requirements for equipment.
- Simplifies inventory problems—eliminates movement of partial drum to and from jobs.
- Ease of handling—containers can readily be moved by one man.
- Simplifies storage problems—containers can be stacked.

Chances are these 75 lb. containers of *Pitt Chem* Enamel can help you in *your* streetside operations, too! Write or call for additional information . . . today!

PROTECTIVE COATINGS DIVISION
PITTSBURGH COKE & CHEMICAL CO.
Grant Building • Pittsburgh 19, Pa.

WSW 6537

COAL CHEMICALS • PROTECTIVE COATINGS • PLASTICIZERS • ACTIVATED CARBON • COKE • CEMENT • PIG IRON

Memo From The Editors

Fuel for Thought

NOW that we have had a national TV show with gas industry sponsorship for two months, it is time to lean back and take a long look at it. Just how effective is it? The show, *Playhouse 90,* is tops from the viewer's viewpoint. It is one of the best dramatic presentations available to the vast audience in TV-land. The gas industry has gained in stature thru its sponsorship of the program. Selection of lovely Julia Meade as our "leading lady" to promote the sale of gas appliances is a feather in our cap. Attention drawn through excellent and widespread promotion of gas industry sponsorship of Playhouse 90 is an invaluable asset.

There is some doubt, however, in the minds of many utility people that this particular program is as effective as it should be. Certainly it is a step in the right direction that our industry is sponsoring any type of national TV show. But the manner in which commercials (and isn't that what we are really buying with our two million bucks — commercial time) are presented on *Playhouse 90* definitely has something lacking? Here's the case: we have bought the last one-third of a 90-minute show. At the end of the second portion, there is a sponsor's message, followed by a station break, followed by our commercial, and then the show resumes. During this three-minute interval, how many people remain glued to their seats? Most of them probably dash out for refreshment of some type — three minutes is a long time.

Thus our commercial time — hypothetically — is reduced to one-half effectiveness. And how many people, after watching a 1½-hour show, stay to see the closing commercial? With "every other week" full-time sponsorship, it might be assumed that we are getting a 25-cent return on each dollar invested. Our real assets resulting from this sponsorship are the external identification produced by external promotion, and the value of Miss Meade as a representative of the gas industry. Actually, our TV commercial time may not be as productive as we think it should. AGA's TV committee is aware of these problems. Network red-tape makes it more than difficult to correct the problem of timing commercials. And networks listen more to audiences than sponsors.

We have also noted concern on the part of many utility men over the type of commercials presented to the viewing audience. The commercials we have seen are smooth, well performed, well directed, and carry some kind of message. We haven't figured out what kind.

In our humble estimation, we are letting a good thing slip through our fingers. For nearly a decade, industry leaders have pointed out that we must be competitive if we are to remain in business profitably. We haven't seen any of this "competitiveness" in the TV commercials for the gas industry on *Playhouse 90.*

Where's the old SELL? Is there anything wrong with mentioning that gas is *really more economical?* That it, too, is *clean* and *cool?* That gas ranges are *really automatic* and don't have "Hangover Heat?"

We've got a good thing in this national TV show. We also have a lot of money invested. We can't afford to be complacent. We must continue to constructively criticize our efforts and always work towards something better.

In This Issue

March is the month when the energetic, progressive New England Gas Association holds its annual meeting in Boston. Saluting this venerable organization, we have compiled a group of informative articles for this issue. They are articles that will also be of interest outside the New England area — thought provoking and educational.

Fred H. Faulstich, current NEGA president, outlines the need for "Real Vision in the Gas Industry." Ed Rudd comments on "What is a Desirable Rate for Heating Gas" and C. S. McKinley asks "Why Not Try Pattern Meter Reading." Who's Who in NEGA and a brief history of the gas industry's oldest regional organization are also presented.

Atlanta Gas Light Company is justifiably proud of its latest achievement — first of its kind in our industry — a refrigerated storage plant for propane, used in its new Riverdale standby plant, as told in our lead story this month.

Those of you who clipped last month's "Laundry Promotion Survey" for your files on better merchandising methods will find the six-page "Exhibit-in-Print" worth clipping, too. Here is a catalog of the latest in gas and water heaters and clothes dryers.

Many subscribers have requested that we include a "Handy Reply Card" in AGJ as an aid in making inquiries about new products and trade literature. This service starts with this issue. Just circle the items you want to know more about, and we'll see that you receive the information. All you need is a pencil or pen — we pay the postage.

With this issue, we kick off the first of some 50 chapters in the American Gas Fundamentals. We're starting right at the beginning — the geology of the earth and how it relates to finding natural gas. From here, subsequent chapters will go right thru the steps of getting the gas, processing it, transporting it, and delivering it to the customer. Plus a host of chapters on all other related subjects, such as utilization, public relations, metering, construction, standby plants, gas manufacture, etc.

The final section of the **Glossary** will be published in April. For those readers who would like a complete reprint of the extensive glossary, it will be available very soon, along with a binder for filing the monthly Fundamentals chapters clipped from regular issues of AGJ. This package will be available with either new or renewal subscriptions. Look for an announcement in the April AGJ.

Letters

EDITOR:

I think the *American Gas Journal* is doing an outstanding job. I would like to compliment your editor for the kind of publication you have and also the fact that through this publication you have been able to disseminate good information to its readers.

Jerome P. Happ, General Sales Manager
North Shore Gas Company
Waukegan, Illinois

EDITOR:

Your merchandising section renders a definite service to the industry and is a source of information that is both worthwhile and interesting.

P. R. Shea, General Sales Manager
Southern California Gas Company
Los Angeles, California

MAR 18 1957

American Gas Journal

Established July 1, 1859

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Printed in U.S.A.

AMERICAN **Gas Journal**

NINETY-EIGHTH YEAR

GAS TECHNOLOGY — OPERATIONS — EQUIPMENT — MANAGEMENT — UTILIZATION

VOLUME 184 **March, 1957** NUMBER 3

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AMERICAN GAS JOURNAL, March, 1957, Vol. 184, No. 3. Published monthly (except September, then semi-monthly) by The Petroleum Engineer Publishing Company, P. O. Box 1589, Dallas 21, Texas. Second class mail privileges authorized at Dallas, Texas. Executive and Editorial Offices at 800 Davis Building, P. O. Box 1589, Dallas 21, Texas.

Mcf

News Item: The following wire service story appeared in newspapers across the country in early January:

TWIN FALLS, IDAHO — Attractive Barbara Nelson, local actress, was recounting the virtues of an electric range during a commercial on Station KLIX-TV here when she reached for the door of the oven, suddenly recoiled and fell to the floor. The camera quickly switched to another scene. Later, an announcer explained she had received "a slight electrical shock." She was not badly hurt.

Live modern — and dangerously, too!

The outlook on natural gas legislation. Observers of the congressional front say there won't be repeats of the big battle that took place over the Harris-Fulbright Bill last year. Instead, a compromise bill acceptable to both producers and distributors will be worked out. There is some question, however, if such a measure will be introduced in this session. The presidential veto of the bill passed last year makes it almost mandatory that all segments of the gas industry support any new measure with unified action. Such new measure would probably have to include definite consumer protection — and eliminate open-end escalation clauses. FPC regulation of gas producers becomes more confusing and chaotic by the day. Establishment of a fair-field-price basis for regulation may be the answer.

Florida's first natural gas line is making progress. The $150,000,000 project of Houston Texas Gas & Oil Corporation and Coastal Transmission Corporation has filed with FPC a higher rate schedule as required under the tentative approval given by the commission. Two Florida power utilities plan to take 60 percent of the line's capacity. To do it, the gas producers supplying the line agreed to reduce their prices, with the utilities buying the gas directly and paying the pipelines for transporting it. The pipelines have also requested a waiver on the FPC stipulation that the surplus gas for industrial use be priced competitively with fuel oil.

Public service commissions are in the news. In Iowa, a bill has been introduced that would create a public service commission with full powers and would abolish the present state commerce commission, which has only limited jurisdiction over common carriers, etc. New York's legislature has received a bill that would set up a legislative committee to study and revise the state's public service commission procedure and law. In Texas, a bill has been introduced that would set up a full-powered commission to regulate gas, electric, and telephone rates. In Washington, a new bill would give gas utilities power of eminent domain.

Over 70 percent of Westcoast Transmission Company's new gas line has been completed. The Canadian carrier, which expects to export 300,000,000 cu ft to U. S. markets this fall, is a 650-mile, 30-in. line between northern Alberta and lower British Columbia.

Insurance companies, according to The Institute of Life Insurance, own more than half of the $25-billion funded debt of the nation's public utility companies — including gas utilities and pipelines. Life insurance companies in 1956 held $13,537,000,000, of which about one-fourth was invested in the gas industry.

Unification of Kings County Lighting and New York and Richmond Gas companies into Brooklyn Union Gas Company has paid off for customers of the new Brooklyn Union; the company has filed new rate schedules with the state PSC that would reduce prices for consumers in Brooklyn, Queens, and Staten Island by $1,434,000 annually. The commission noted the reduction was the largest single rate decrease by a gas utility since 1921.

Eight large industries and the federal government, all customers of Arkansas Louisiana Gas Company, have appealed to the state's highest court an Arkansas PSC order granting the gas company a $4,000,000 annual increase in rates to large industrial users. The Arkansas Supreme Court has taken the appeal under consideration. The rate increase was granted in November 1955 and had been collected under bond since April 1955. The bonded collections have been continued, pending disposition of the appeal. A lower court had refused to disturb the PSC order.

Regents of Washington State College have asked the Washington state legislature for an emergency appropriation of $118,000 to convert the college's central heating plant from coal to natural gas. Savings equal to the $118,000 would result from lower fuel costs during 1957-59, the college president pointed out.

Co-op groups, which lost their battle to set up local co-op gas distribution systems in Idaho cities because the Idaho state constitution prohibits such action, are seeking enactment of legislation by the state's legislature to allow cities to finance such natural gas cooperatives by issuing general obligation bonds. The co-op group's spokesman, Perry Swisher of Bannock, said such legislation would be sought in place of trying to amend the state constitution, a method that would "take too long." Observers in the state doubt that such an amendment would gain statewide public approval. Meanwhile, many of the so-called "co-op" cities have announced they are granting franchises to Intermountain Gas Company.

Southern California Gas Company has filed application with California's PUC for permission to increase gas rates to 1,600,000 customers by about eight percent overall. The company said the increases for individual customers would be about 40 to 55 cents per month. It pointed out that its earnings continue to decline each year, adversely affecting the company's credit standing and putting it in an unfavorable position to sell new securities for financing expansion of its facilities.

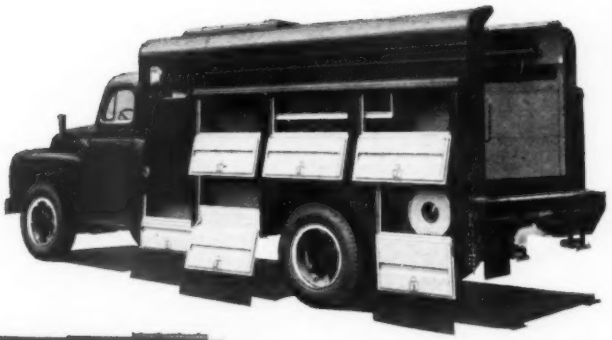
The natural gas common stock price index during January recorded an all-time high of $41.71 per share, 12.9 percent higher than for the same period in 1956. Dividend payments were larger too, currently averaging $1.89 per share, a year-to-year increase of 8.6 percent, returning a yield of 4.53 percent. Distribution company stocks were up 1.8 percent for the year while transmission company stocks jumped 17.9 percent.

APR 18 1957

Standardized..

Standardization of truck bodies and equipment is increasing in importance. Operating companies have found that standardized bodies improve efficiency. They enable crews to work from different vehicles with no difficulty in locating tools or supplies. They reduce operating costs by stepping up productive manhours. They provide fleet similarity...and are most economical from the standpoint of initial investment and maintenance costs.

In the Powers-American line you'll find standardized service, maintenance, and construction bodies...built to specifications that are based on known requirements. Modifications can be made, if necessary, to fit your needs. Production in quantity reduces cost and delivery delay. Why not investigate the merit of these bodies for your job?



STANDARD SERIES 850-C GAS AND WATER LINE CONSTRUCTION BODY, with built-in air compressor and air hose reels.

Custom-Made

The widely varied operations necessary in transmission of gas or water makes complete body standardization impractical. In supplying custom-made bodies and equipment to operating companies throughout the country, Powers-American engineers have developed production methods that greatly reduce costs. If your work requirements call for equipment that is tailor-made in every respect...or if you can use bodies which are modified from standard designs...Powers-American can supply the unit you need, at a cost that is reasonable. Should you require complete plans or assistance in the development of special equipment, Powers-American engineers are at your service.

CUSTOM-MADE LINE CONSTRUCTION BODY

POWERS American GAS & WATER BODIES

Want more information on Powers-American standardized bodies? Just drop us a line and tell us the type of body you need. For details on custom-made bodies, please send us a description of the equipment you require, plus sketches which may be helpful in supplying the data you desire.

CUSTOM-MADE SERVICE BODY

STANDARD SERIES 44 SERVICE BODY

McCABE-POWERS AUTO BODY CO.

5900 NORTH BROADWAY, ST. LOUIS 15, MO.

428 LATHAM SQ. BLDG., OAKLAND 12, CALIF.

"The Accepted Standard with Utilities Everywhere"

Building Bigger To Serve You Better

Dresser Manufacturing Meets Gas Industry Needs With Multimillion-Dollar Expansion Program

Steel worker secures roof girder in place on the new Dresser Manufacturing plant at Wellsboro, Pa. The new plant will be devoted to production of gas service fittings.

The big new Dresser Wellsboro plant is equipped with specially designed, high-speed, largely automatic production machinery.

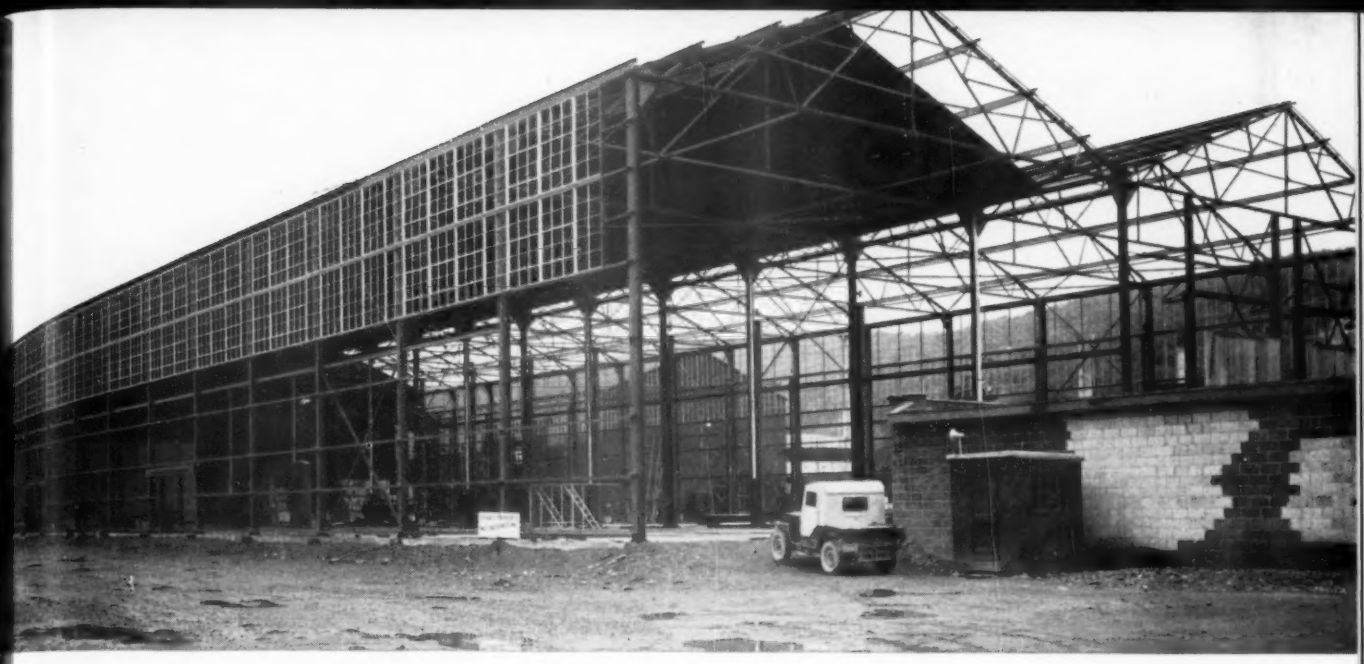
Gas is America's most wanted fuel. With new homes going up at the rate of more than a million a year and industry expanding at a $40 billion-a-year clip, our gas utilities can feel proud of doing a tremendous "growing job" to meet this need. As a company which has worked closely with the gas industry for 75 years, Dresser has naturally been expanding its facilities to better supply the quality pipe joining and repair products needed by the gas industry.

Dresser has more than doubled its plant size since World War II. At present, a large new addition to the Bradford plant is about ready to begin production. A completely new compression fittings plant is being outfitted at Wellsboro, Pa.

The Bradford addition will give Dresser a sizable increase in production capacity on the company's general line of couplings, clamps, sleeves, etc., plus manufacturing space for a number of new products now under development.

The new Wellsboro plant will be devoted to production of gas service line fittings used from the main to the meter. Modern production tools and methods will provide maximum efficiency and increased volume.

The wide and growing use of Dresser couplings, fittings and repair products throughout the gas industry can be credited to the time-proved reliability and dependability of the Dresser sealing

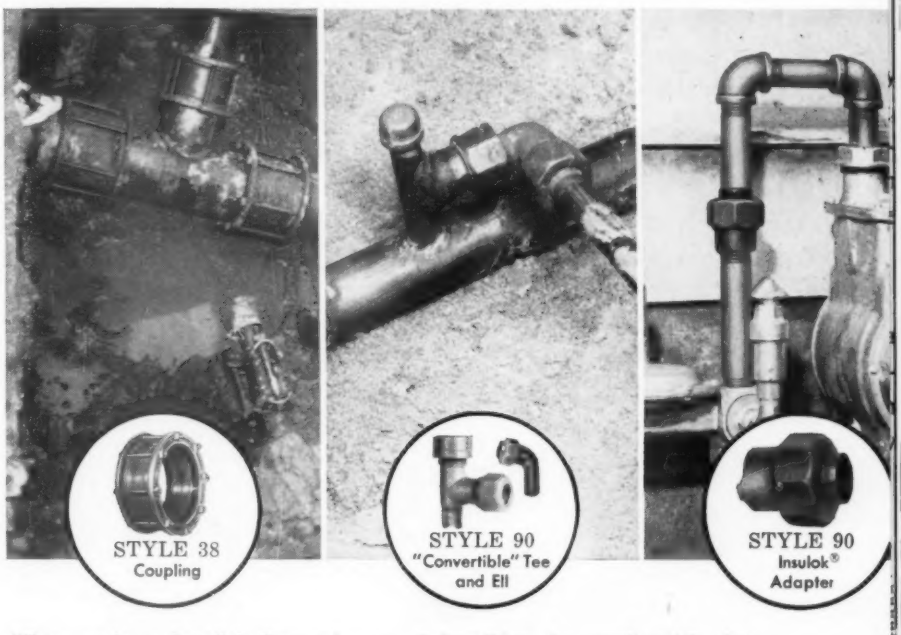


Big Dresser expansion program at the home plant in Bradford, Pa., will greatly increase production capacity for repair clamps and sleeves, saddles, and other products essential to the gas industry and many other industries that depend upon efficient piping.

principle. Also, since they speed and simplify pipe installation and maintenance, Dresser products have played their part in helping the gas industry do its job with speed and economy.

With Dresser products, a wrench is the only tool needed to make a perfect joint or permanent repair. Ordinary workmen can install them quickly and easily, even when working in a narrow trench or other cramped quarters.

You may look to Dresser, too, for a constant stream of new products and product improvements. Coupled with its big plant expansion, Dresser is enlarging its engineering and research facilities. All of this investment has but one aim: to make Dresser more and more a *"fitting partner for the gas industry"*.



"From main to flame" is Dresser's way of describing the coupling job that Dresser's couplings and fittings do. Shown above, left to right, are actual installations: on the main, on the service line, and at the meter.

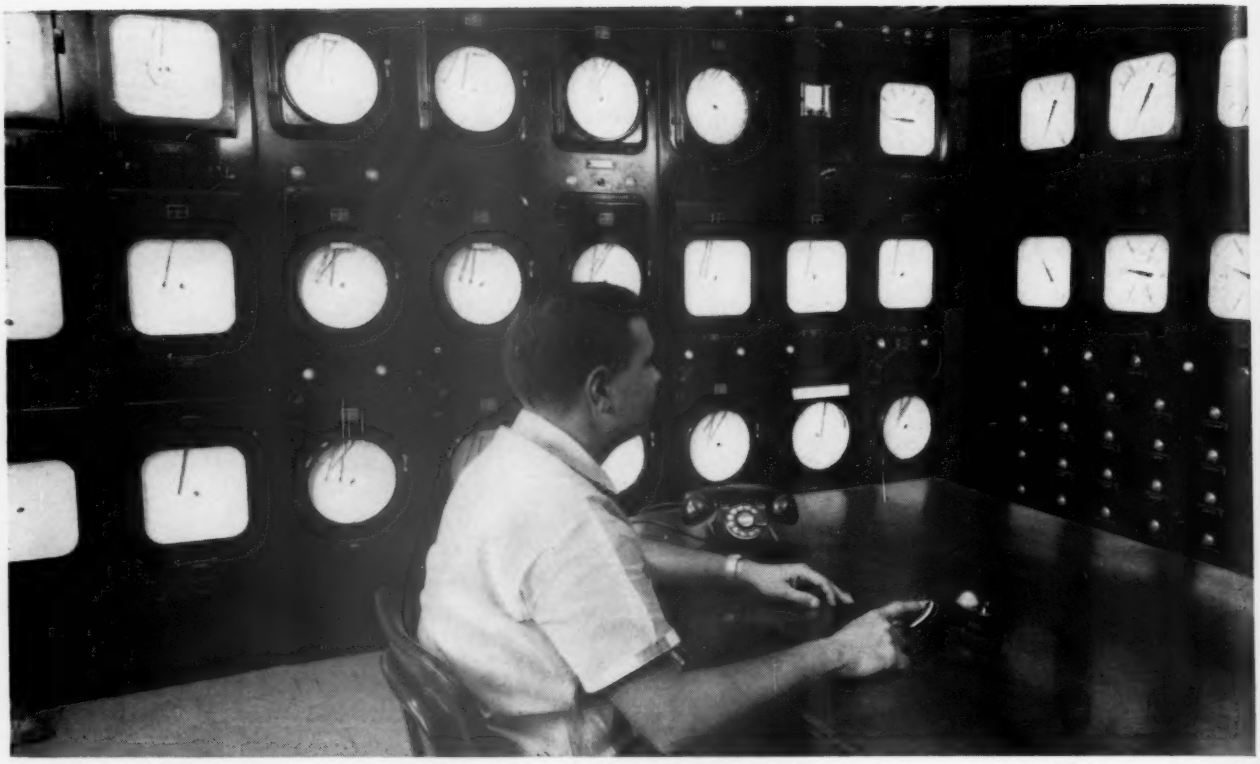
Write for your free copy of Dresser's illustrated 36-page catalog, *Dresser Fittings for Gas Service Connections*. Contains complete information on styles, sizes, dimensions, applications, and installation.

DRESSER®

ONE OF THE DRESSER INDUSTRIES

FITTING PARTNER FOR THE GAS INDUSTRY

DRESSER MANUFACTURING DIVISION, Bradford, Pa. Warehouses: Houston, S. San Francisco. Sales offices also in: New York, Philadelphia, Atlanta, Denver. In Canada: Toronto and Calgary.



Bell System *selective calling* is used by the dispatcher of Mississippi Valley Gas Co. By flipping a switch, dialing the number of a distant metering point and reading a meter, he knows the pressure, flow and temperature at any of the company's 21 field points.

"When you're sure how much you have, you know how much you can sell"

J. H. Lambdin, Vice President—Operations, Mississippi Valley Gas Company

Bell System telemetering channels provide data on which Mississippi Valley Gas Co. can regulate flow to within 1% of a 60,000 MCF supplier contract limit. With this up-to-the-minute picture of the system, the company is better able to sell more gas.

This system, first of its kind in the country, was designed especially for Mississippi Valley. Used only to read remote meters now, it can be adapted to perform actual control functions at distant points.

• • •

If you'd like to have faster, more efficient communications, call your Bell Telephone representative. He will be glad to study your needs.

BELL TELEPHONE SYSTEM

PRIVATE LINE TELEPHONE • PRIVATE LINE TELETYPEWRITER

CHANNELS FOR: DATA TRANSMISSION • TELEMETERING • REMOTE CONTROL
TELEPHOTOGRAPH • CLOSED CIRCUIT TV

from foundry to finished product...

Quality first

Quality, above all things, is the guide for Mueller manufacturing operations and the standard by which all Mueller products are made.

From raw materials in the foundry to final inspection before shipping, highest quality in workmanship, materials and design are united to form a superior product that will serve *dependably* through the years.

Mueller Co. was founded with a tradition of "Quality and Dependability"—a tradition that has been rigidly maintained through a century of service!

A huge vertical boring mill faces the bottom by-pass of a 30" gate valve hub end body. Precise machinery produces precise products.

A lock nut of a Lub-O-Seal meter stop is adjusted to a specified tightness by this assemblyman using a torque gauge.

Each day, incoming raw materials are analyzed by laboratory testing to insure rigid adherence to industry standards.

Performance
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Skilled Mueller craftsmen use lengthy experience, careful training and modern machine tools to produce water and gas products that give superior performance to you—the user...and their work is proved by many rigid inspections and exacting tests.

IN THE FOUNDRIES

Sands are graded, tempered and treated to assure perfect molds from patterns and core boxes fashioned by skilled artisans in the pattern shop of Mueller Co.

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Precise machine tools, operated by expert machinists, cut, turn, bore, grind, thread and work the castings into precision parts. Extremely close tolerances insure perfect mating of component parts and long-lived operating ease.

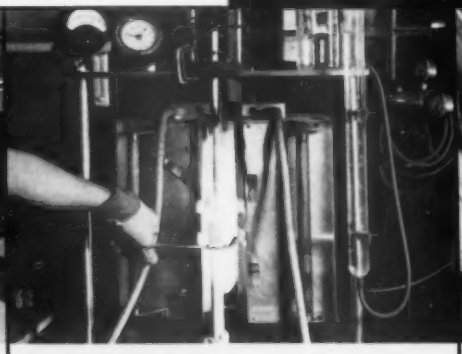
Machined parts are inspected with precise instruments, ranging from micrometers to microscopes, to assure accuracy of each piece.

IN ASSEMBLY

Individual parts are brought together for assembling by proficient craftsmen. These men prepare the finished product to detailed specifications, with each step checked by the ever-critical inspectors, making sure that the required perfection has been attained.

Each Mueller craftsman is instilled with the need for dependable, long-lived equipment in the essential gas and water industry...each does his part to create a product that will fulfill that need. Superior performance is the product of Mueller Co.

Exacting specifications are established by experienced engineers who know customer requirements and material qualities.



Molding sands are checked by a technician for compressive strength, permeability, moisture content and density, assuring flawless castings.

A semi-automatic machine cuts and threads both ends of a curb stop simultaneously to prevent distortion and damage.

urface smoothness and contour is revealed by a Profilometer, a precise instrument that elps a corps of inspectors in their work.

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enlarged picture of the contour of tools, gauges and products. Rigid tolerances are easily maintained.

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Since 1857

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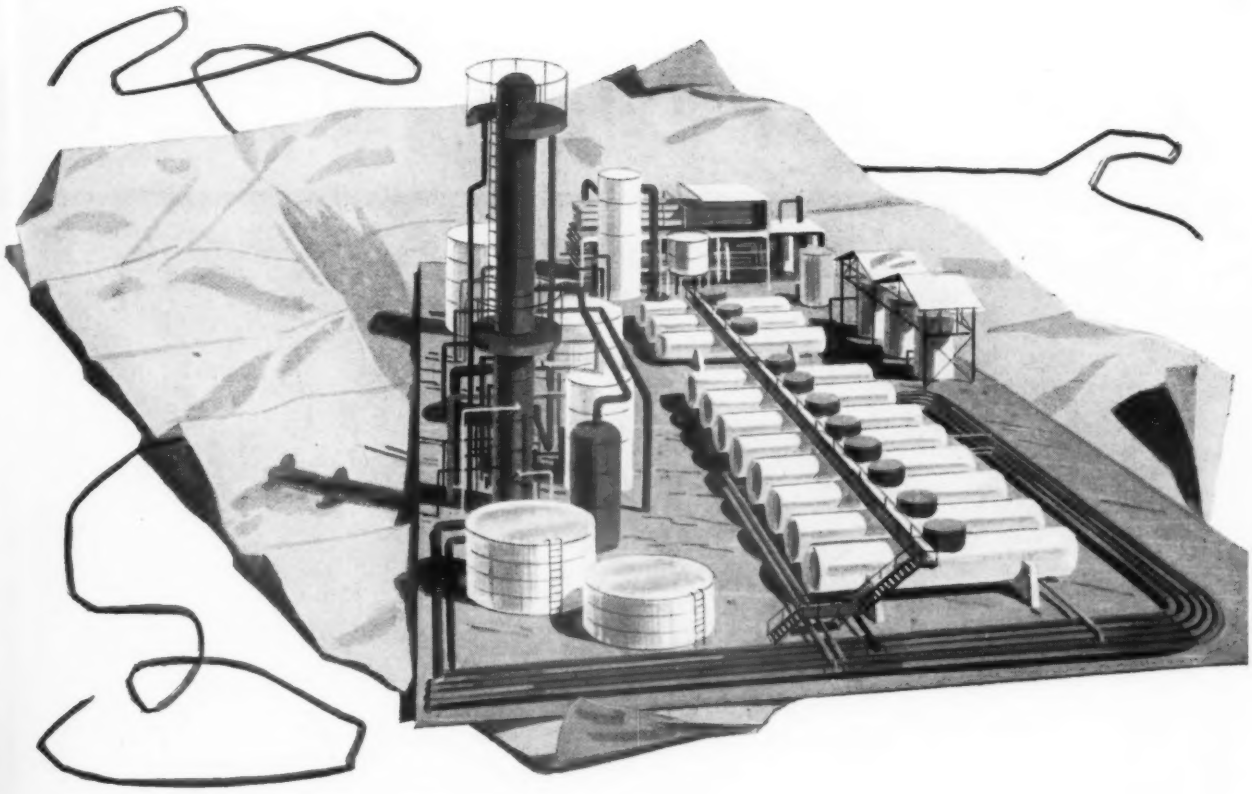

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The light weight, hi-tensile alloy steel construction and smooth crawler mounting of this Cleveland 92 "Baby Digger" enabled Rich & Co., Bradford, Pa. to cut 70,000 feet of trench in stony tough digging without causing damage to the sidewalks and fine old lawns in and around Groton, N. Y. The compact design and quick-and-easy maneuverability of the 92 were other big helps in digging these 4-inch pipe gas mains and laterals for New York State Electric and Gas Co., Ithaca, N. Y. The rugged 92 weighs only 10,000 pounds, is only 4½ feet wide over its crawlers, yet digs 10 to 20 inch trench widths and down to full 5 feet deep—in *all* soils.

The 10,000 lb. 92 treads lightly on lawn and sidewalks.

Compact 92 can put trench within 20" of side obstructions.

Good Everywhere

THE CLEVELAND TRENCHER COMPANY

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ST. PAUL, MINNESOTA: King Boreas XXI of the 1957 St. Paul Winter Carnival is a gas company executive — James F. Owens, Jr., vice president and manager of the St. Paul division of Northern States Power Company.

SEATTLE, WASHINGTON: It's warm inside this outside swimming pool at the Seattle Tennis Club. Cozy 78 F water keeps bathers comfortable while snow falls. Even the walkways are heated by gas-fired steam. About 1,500,000 Btu's per hour (1500 cu ft) of natural gas are used to maintain the pool temperature. Washington Natural Gas provides the fuel.

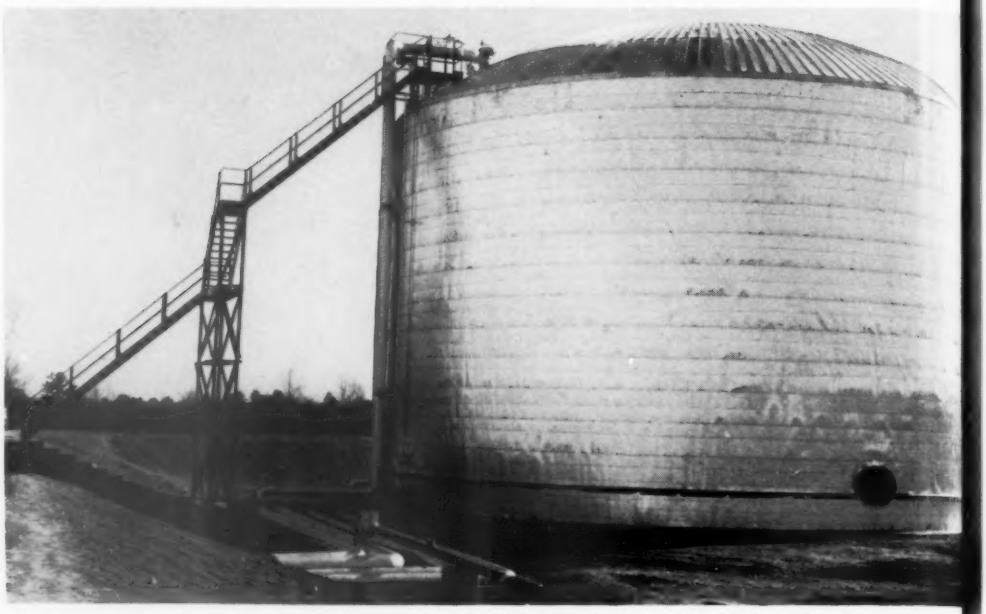
Mcf PICTORIAL PAGE

NEWS-VIEWS OF THE GAS UTILITY INDUSTRY

EL PASO, TEXAS: Service calls take Cecil Pesnell, Southern Union Gas Company serviceman, to all sorts of homes. He lights heaters of all kinds. He was a bit surprised, though, when he answered a call from El Paso's Washington Park Zoo and found he was needed to service a panel-ray heater in the elephant cage. The elephant was not only harmless, but quite helpful.

READING, PENNSYLVANIA: Twenty representatives from 12 eastern area gas utilities review gas burner construction at a special school on gas-fired boiler equipment held recently by Orr & Sembower, Inc., manufacturers of packaged automatic boilers.

CHICAGO: Lucky homebuilder John Janorsky, Elyria, Ohio, won a new 45-gal, deluxe glass-lined water heater, given in a drawing by the Permaglas Division of A. O. Smith Corporation Kankakee Illinois. L. to r. are "Miss Permaglas" (Miss Vivian DeVine); Ken O'Gorman, Permaglas district manager, Chicago; and L. H. Hoelter, builder sales manager, Chicago.



Refrigerated storage tank is 70 ft in diameter and 52 ft high. It is constructed of .365-in. wall thickness carbon steel plate, insulated with 8-in. of foam glass, and has a heat-reflecting coat of thin aluminum sheeting. Vertical pipe at extreme left carries propane vapor to refrigeration machinery. Pipe in foreground is bleed line leading to flare.

DEEP FREEZE For Standby Plant LP-Gas

In the heart of Dixie, a unique new process keeps propane cool while in storage, saving on hard-to-get steel and cutting storage costs.

AN engineering first in the U. S. for the gas utility industry has taken place at Atlanta Gas Light Company's Riverdale plant 12 miles south of downtown Atlanta.

That's the site of the first operational plant for storing propane under refrigeration. Final installation of equipment and clean-up of the yard of the $2,000,000 plant, begun in June, 1956, has been completed.

Filling of the giant, 1,290,000-gal storage tank began in early December and was completed in late January, when the plant was put into operation. Purpose of the plant, like other standby facilities, is to provide a supplemental source of gas for peak-day demands that can't be met by pipeline contracted supplies.

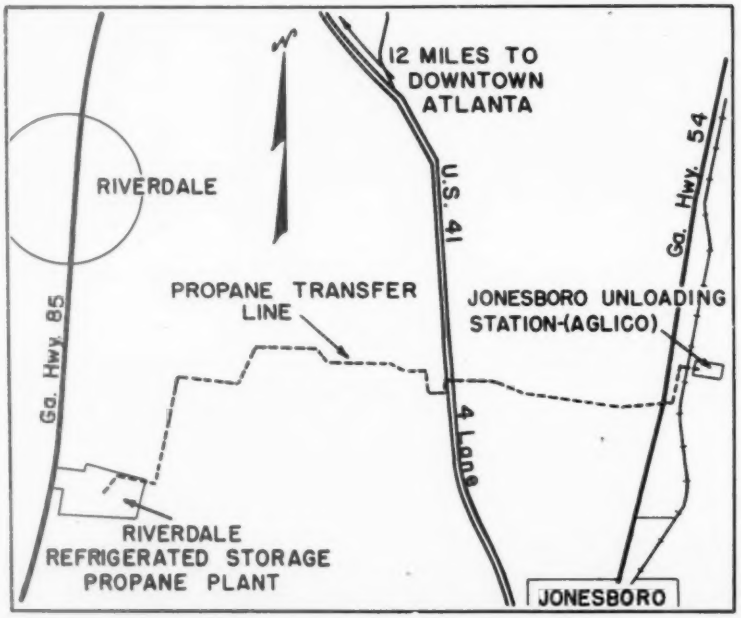
Advantage of the refrigerated storage is summed up in one word: *Economy*. Price tag on the Riverdale tank is about $250,000. Pressure storage tanks of the same capacity would have cost $750,000. Savings were realized in both fabrication and materials. The Riverdale tank weighs 100-ton, where 48 pressure tanks (giving equivalent storage) would weigh over 1800-ton. Most of this weight is in steel.

How It Works

The accompanying simplified schematic flow diagram (Fig. 1) of the Riverdale plant shows the basic elements and operation of the facility.

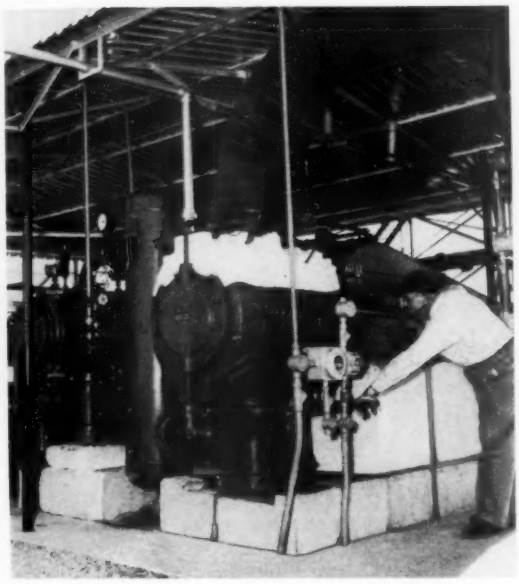
Liquid propane is received by railway tank car at the Jonesboro unloading station, and from that point is piped five miles to Riverdale. The propane is transferred at 100 psi and a temperature of 60 F through a 3-in. pipeline.

This pipeline discharges into the 1,290,000-gal refrigerated storage tank. The liquid propane enters the tank through a flow control valve that reduces the pressure from 100 psi to ½-psi (tank pressure), and maintains a prescribed rate of flow into the tank. As the pressure drops, the propane vaporizes and is chilled. Only about 52



Map shows location of Riverdale plant to other Atlanta Gas Light Company facilities.

Compressor wears a white ice cap. Liquid propane from condensers is boosted to 200 psi, then reintroduced into storage tank at ½-psi, where flashing furthers cooling in tank through heat absorption.



Aerial view of Riverdale plant shows general layout. At rear is shiny 1,290,000-gal refrigerated storage tank. To its left is the refrigeration shed. In middle is compressor building and standby power generator. Tall structure immediately behind compressor building is gas-fired vaporizer. Propane-air and natural gas are mixed at junction of lines near the tree at left center of picture.

Heat exchanger (left) and separator (right) installation. Heat exchanger is used to cool compressors in building barely visible in background and to warm propane to 100 F. Heavily insulated pipe in foreground transports liquid propane at a cold —46 F from storage tank.

Refrigeration machinery. Propane vapor goes through fan-cooled condenser units (center of photo) where heat is removed and the propane liquefied before being reintroduced into tank.

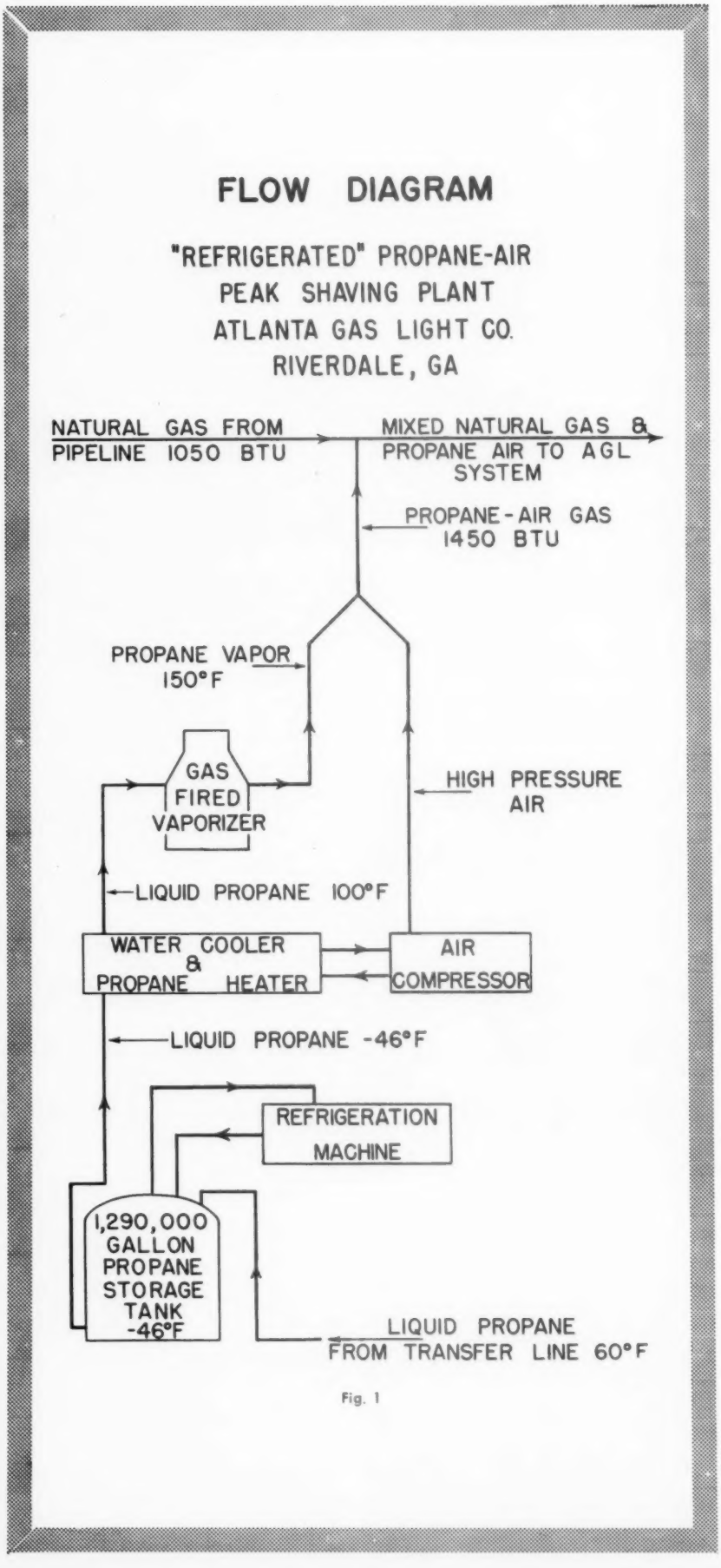


Fig. 1

percent of the liquid propane vaporizes at this point.

Heat is taken out of the tank in the propane vapor, which is liquefied at 200 psi as heat is removed from the vapor. The liquid propane then is reintroduced into the storage tank through a back pressure valve and the flashing (vaporization) again takes place, producing more cooling.

From the storage tank, the propane is pumped out as needed and passed through a heat exchanger where it is warmed to 100 F. The heat exchanger also cools the compressors. The warm propane then passes through a gas-fired vaporizer, where it is vaporized into a gas. Next, it is mixed with high pressure air and the propane-air mixture is mixed with incoming 1050 Btu pipeline gas, and the entire mixture forwarded to the company's distribution system.

Safety Precautions

To reduce the possibility of accidents and to insure that any that might occur would be confined to Atlanta Gas Light Company property, elaborate safety precautions have been built into the plant.

"What happens if the 'refrigerator' goes off? Won't the pressure from increasing heat inside the tank cause trouble?"

In answer to these two questions, several precautions have been taken. First, the insulation material around the tank will maintain the temperature low enough for 36 hours to prevent any trouble. Second, an auxiliary generator for power is located in the compressor building and immediately available. Third, a pop-off valve will allow the propane vapor to dissipate itself after 36 hours. Fourth, a bleed line and flare can drain off and burn up the contents of the entire tank safely.

"What if the tank leaks?"

This is considered unlikely, as all welds on the tank were X-rayed, and when flaws were found, joints were rewelded. Tank construction is .365-in. thick plate of carbon steel. The possibility, however, was considered, and for safety purposes, a square earthen dike was constructed around the tank. The enclosed dike area is of sufficient capacity to confine the entire contents of the tank. As an added safety measure, eight pilot lights have been installed atop the dike, which would ignite any of the propane that might spill over the dike.

Developing the safety measure required considerable research, since the refrigerated tank is the first of its kind to be built, and there was no safety code in existence to cover its operation.

* * *

Want to stop re-routing?

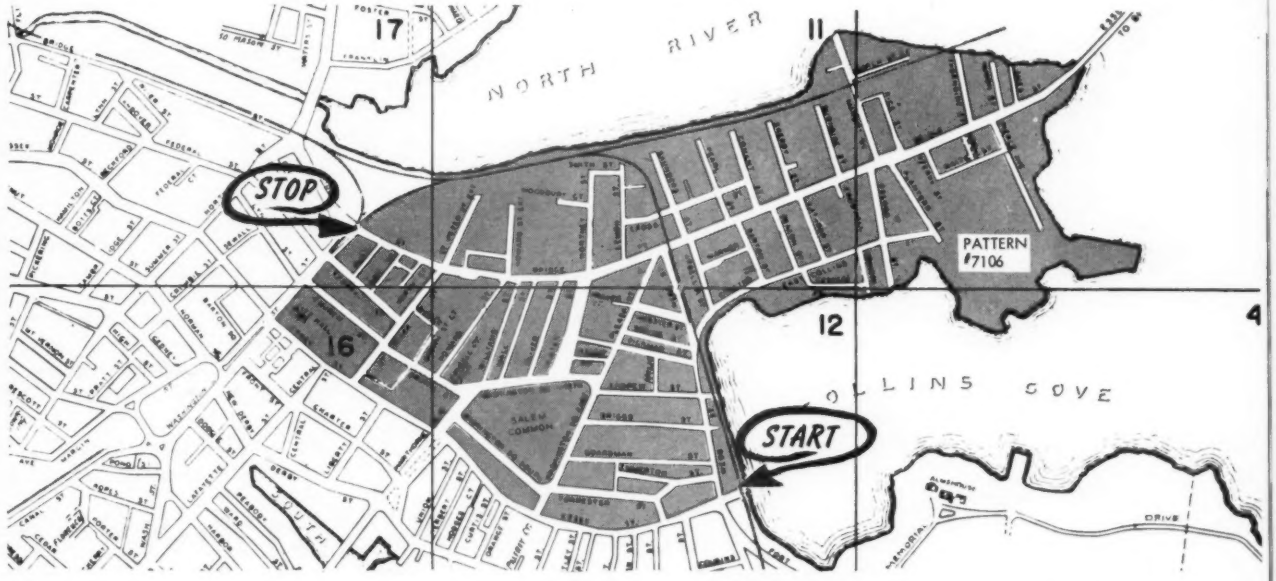


FIG. 1. Map shows location of "Pattern 7106" as laid out in an area of Salem, Massachusetts. It contains 13 old meter books and contains 3412 gas and electric meters

Why Not Try

Pattern Meter Reading?

Building programs in recent years have made meter-book re-routing necessary, accompanied by many tedious hours of accounting department readjustments — a headache that still might have to be done again; here's a report on one company's practical experiences with a bright, new idea to correct such situations

C. S. McKinley, *Commercial Supervisor*
North Shore Gas Company,
Salem, Massachusetts

THE creation of an *Account Numbering System,* which would remain permanent and eliminate re-routing, has long been the goal of both the gas and electric industry. The New England Electric System is, at present, installing a new numbering system in its companies that is permanent and one that eliminates re-routing.

Before going into the details, it would probably be expedient to explain that NEES serves both gas and electricity to a large number of cities and towns north of Boston, Massachusetts. In this territory, there is every possible type of meter reading situation. There are single gas, single electric, and combination readings. There are large cities, and small towns, industrial areas, farms, and extensive seasonal areas. The new system has proven satisfactory in all areas, regardless of the type of territory served.

Need for New Systems

Prior to the adoption of this system, two other methods were used: (1) Book-a-day system with block meter reading, and (2) Book-a-day system with complete streets.

Under each system, the book was a control in itself. These methods were satisfactory and would probably have remained so if it were not for the tremendous increase in new home building in our territory. Furthermore, the home building contractors seem to know exactly where new accounts are least expected and they proceed to build 50 to 100 new homes in the territory of a book that is already a full day's work. If this were an occasional thing, it would not be too serious.

All of these developments result in re-routing. Re-routing means changing all of the subsidiary records that are associated with meter reading, such as addressing equipment, service records, customer history, customer deposits, collection records and others.

In almost every case, we were forced to re-route not only the book that had grown but two or three others in the adjacent territory.

Another unsatisfactory feature is that the book-a-day system requires each book, when initially set up, to be "light" up to 10 percent in anticipation of future growth.

Still another objectionable feature is that the number of meters a reader can read in a given day in a given territory controlls all of our customer accounting activities.

Therefore, because what existed was unsatisfactory, even though traditional in the industry, new methods were sought. In comparing other companies, it was found that over 60 percent of the companies throughout the country were also dissatisfied with their account numbering systems. The remaining companies that submitted information, in most cases, were using our present system and felt that it was "currently satisfactory."

None of the systems studied incor-

porated the features that were sought. The problem, then, was to see what could be done to improve the existing method.

What Features Needed?

The first step was to determine exactly what was wanted. The new account numbering system should incorporate the following advantages:

1. It should give the maximum of meter reading efficiency immediately.
2. It should contain a maximum amount of information in the account number.
3. It should be able to adjust to an increase or a decrease in accounts without affecting existing account numbers.
4. It should be simple to install, understand, and operate.
5. It should at no time have any detrimental effect on bookkeeping and associated functions.
6. It should be adaptable to changes in method.
7. It should be adaptable for use by other departments within the organization.

To obtain the initial maximum efficiency in meter reading, each book must be loaded completely with no allowance for expansion. Certainly no method of reading is as fast as block reading but, even with block reading, room for expansion must be allowed. It was determined that, where block reading was used, it should continue to be used. In one company that did not have it, a change was made to the block reading system. To load a book completely and maintain the block system meant using consecutive reading and numbering.

"Breaking" The System

The next problem was to decide where to break the consecutive numbering system. It was desired to identify each accounting office that was the first breaking point, and to identify each city and town, setting up the second breaking point.

Thus, the fundamentals for starting were developed. The first digit would represent the office; the second digit, the city or town within this office.

The next problem was to decide if any further breaks were necessary in the consecutive numbering system. The following factors entered into this problem: (1) Car readings should be separated from walking readings. (2) Uniform number of accounts per unit desk must be maintained.

To maintain a *Permanent Account Numbering System*, it was necessary to create a method where increased growth would not force an account from one bookkeeping unit to another because of expansion. Thus, breaking points were set up at one month's work for a meter reader and/or one month's work for a unit desk. This is called a "pattern" and all the meters in the patterns are numbered consecutively in reading sequence.

How It Works

Fig. 1 shows a map of one pattern as laid out in the city of Salem. To the extent possible, natural boundaries are used to designate a pattern, such as, rivers, main streets, main highways, etc. The size of the pattern is dependent upon the congestion within an area and is controlled somewhat by the existing customers and the amount of undeveloped land.

Generally speaking, the smaller patterns will be in downtown areas and the larger patterns, residential or areas including either undeveloped or restricted areas, such as institutions, swamp areas, cemeteries and the like. Pattern No. 7106 is composed of 13 old meter books and it contains 3412 gas and electric meters. The territory is routed and numbered consecutively with 10 folios allowed between each account as this is a fairly congested area with little room for future expansion.

The 7106 tells us the following:

A. The "seven" indicates it is a district in the Salem office.
B. The "seventy one" indicates that it is in the city of Salem.
C. The "06" indicates that it is read in the even months of the bi-monthly period.

If this were a rural area, allowances would be made for 50, 100, or even 200 folios between accounts. The previous numbering system contained nine digits, broken down as follows:

Dist or Office	Unit Desk	Book	Folio	Total
1	74	01	1234	9 Digits

The new numbering system can be broken down as follows:

Dist or Office	City	Pattern and Month Read	Folio	Total
7	1	06	12345	9 Digits

How large are the patterns? They vary from 600 to 4500 meters. The largest pattern has about 15 old meter books, leaving plenty of room for expansion.

This, then, is the complete numbering system. The first digit is the office, the second digit is the city or town, the third and fourth digits are the area within the city called a "pattern," and the fifth through ninth digits are the folio numbers. Each pattern is complete on one unit desk. No unit desk designation exists in the account number, but a listing is maintained showing what pattern numbers are on each unit desk.

Advantages of New System

Provides maximum meter reading: Consecutive block meter reading is certainly the most efficient method of reading meters and, with the consecutive numbering feature, it is not necessary to leave room for future expansion, giving us maximum reading efficiency immediately.

Contains maximum amount of information without becoming cumbersome: The information contained in this number is considerable. Studies can be made by company, by city, by district within a city, by billing month, or any combination of these factors. The number is not cumbersome as it is identical in size to the present number.

Adjusts to an increase or a decrease in accounts without affecting existing account numbers: Once an account number is assigned it will remain the same for an indefinite period. Re-routing will mean only a regrouping of accounts into new route books, but no change will occur in the account number. It is possible to decrease or increase the work load on a unit desk without changing the number, as no direct reference is made to a unit number. Merger of companies or districts will require no renumbering as there are no duplicate numbers.

Simple to install, understand, and operate: Installation of this system is simpler than previous re-routing tasks as considerable field checking has been eliminated. No difficulty has arisen in understanding or operating the system.

Creates no detrimental effect on bookkeeping and associated functions: It has presented no problems as of now.

Adaptable to changes in method: Some of the NEES companies use IBM punched cards, some use National Cash billing machines, some use Burroughs. North Shore Gas has Elliott and Addressograph equipment. The system works with all of them and they can be interchanged without affecting the account numbering system.

Adaptable to use by other departments: It will be easier for the Meter Department and the Service Department to assign work as the route number will be a district and the orders can be grouped for assignment, keeping the given man's orders as close together as possible.

The system has been found highly satisfactory to all concerned — general management, meter readers, unit desk clerks, service centers, cashiers, billers, (both IBM and mechanical) and customer relation clerks.

Acknowledgment

This article was developed from a presentation made at the New England Gas Association Accounting Division Meeting, Hartford, Connecticut, 1956.

What Is A Desirable Competitive Rate For Heating Gas?

Edward I. Rudd, Jr.

Rate and Research Engineer,
The Connecticut Power Company, Wethersfield, Connecticut

THE question, *"What is a desirable competitive rate for heating gas?"* puts the cart before the horse since the price for heating gas has already been established. It does not, however, preclude discussing the subject.

Two articles that appeared recently in the *AGA Monthly* are of interest here. The first article, in the July-August, 1954, issue, reported the findings of a field test conducted by Consolidated Edison Company of New York. The locality selected was Westchester County, immediately north of New York City, which has a population of about 625,000 and might be called the bedroom of New York.

There are over 70,000 single-family dwellings most of which are heated with No. 2 fuel oil or gas. There were 56 gas-heated and 51 oil-heated homes with heat losses from 28,000 to 197,000 Btu per hour included in the test; the major portion being from 40,000 to 100,000 Btu per hour loss. The final gas-oil relationship from this field test was that it takes 1.423 oil Btu to equal 1 gas Btu; or stated in another way, oil equipment is only 70 percent as efficient as gas.

This article also reported the relative position of the gas storage water heater and oil summer-winter hookups.

The second article was in the April, 1955, issue of the *AGA Monthly*. Many of us have been exposed to the advertising campaigns conducted by local groups of oil dealers discrediting gas for house heating. Their claims have been that gas costs much more, and is not as safe or convenient as oil heating.

The Philadelphia Gas Works did something about it — they made a formal complaint to the Philadelphia Better Business Bureau. To establish the relative efficiency of gas versus oil, they also conducted a field test embracing 64 gas-heated and 64 oil-heated homes. The final results indicated that it took 1.458 oil Btu to equal 1 gas Btu. Comparing conversion equipment, the ratio was 1.452, and for designed equipment, 1.371.

Before going further with this subject, let me tell you what the oil men really think of us, as reported in the January, 1957, issue of a leading trade journal in the fuel oil heating industry.

This magazine annually conducts a survey of a select group of oil heating and fuel oil dealers. This group was asked to comment on their industry's 1957 outlook.

The replies were indicative of their industry's troubles — more complaints than favorable comments, the magazine indicated.

In general, the magazine pointed out:

1. Competition from gas utility companies was tough during 1956 and is expected to increase if fuel oil prices increased.
2. The big problem in the fuel oil and oil heat industry is cost of oil. The higher oil prices go, the more customers will convert to gas.
3. The gas industry is doing a better selling job than the fuel oil and oil heat industry.
4. The electric industry, with its big summer air conditioning load, is also making inroads by pushing electric heating. In some areas it could be serious.
5. There is a general feeling that the fuel oil and oil heat industry has become a second grade industry — outsold and priced out of the market.

What does all this mean? In Hartford, Connecticut, No. 2 oil is now selling at 15.9 cents per gal. On a straight Btu basis, this is $1.13 per Mcf for 1000 Btu gas. If we use $20 for annual cleaning and servicing and $5 for electricity consumed by the oil burner, the equivalent cost of gas based on straight Btu would be $1.32 to $1.25 per Mcf for a 50,000 and 80,000 Btu per hour heat-loss home respectively. From the Philadelphia and Westchester tests, it has been learned that the ratio of oil to gas is some 1.42 to 1. Introducing this relative efficiency to the latter condition results in a gas price of $1.80 to $1.73.

How do your gas prices stack up to these figures?

Let me be quick to add, that unless you are prepared to effectively counter the unethical advertising of the oil men, you had better not dream too long on the $1.75 price for gas used for heating. There is one thing that our industry must do to settle once and for all the relative efficiencies of gas versus oil. We need to have an unbiased, outside testing agency conduct the field tests for us. We might even ask the oil industry to be a party to the test. Even without them, the results would have much more value than similar tests conducted by a gas company. It would then be possible to appeal more effectively to the Better Business Bureaus with the claim of unethical advertising.

It is not necessary to point out all the sales advantages of gas over oil. A low price for gas will not automatically sell space heating. Regardless of the gas price, a well-rounded sales promotion program is necessary. The higher the gas price, the more effective the sales program must be made. We have found allowance for present equipment, five-year service free contracts, budget billing, and guaranteed annual bill to be effective tools for salesmen.

In our company, for our plumber-contractors and gas appliance dealers, we will credit to each an advertising allowance to be paid on approved natural gas appliance advertising over their names as follows:

1. $25 for signing up on this plan.
2. $30 for each central heating job; plus an additional $50 for each 5 jobs over 20.
3. $10 for each unit or console heater installed for commercial.
4. $4 for each other appliance sold.

What about the cost of natural gas? In New England, most companies are being served by Algonquin or Tennessee Gas.

(Continued on Page 42)

Real Vision Counts In the Gas Business

Fred H. Faulstich

President, The New England Gas Association
Vice President, Springfield Gas Light Company

MANY of us have seen numerous changes take place in the gas industry. In the past 10 years, we have seen, at close range, the New England companies make the transition from manufacturing companies — some producing oil gas, some water gas, and some mixtures of coal gas and water gas — to sales and distributing companies. Today, with few exceptions, the only manufacturing we do is to produce small quantities of peak-shaving gas.

Mother Nature relieved us of this burden of manufacturing many years ago when she produced the natural gas which we are distributing today. From an operating man's point of view, the New England utilities have gained many benefits from this change.

Today we are handling a product that is uniform in gravity and Btu — a gas that is much cleaner and which relieves us of many of the dirt and gum problems which we experienced in our mains, meters, and appliances. This "new," yet "old," product has practically doubled the capacity of our distribution systems. While the price has by no means been stable, I think it is safe to say that we would have faced equal or greater increases in the price of the raw materials used in our manufacturing days.

An examination of just one of these items will serve as a good illustration. A little study of your meter-test record will show an amazing improvement in performance. In our own case, the past three years have shown an average net error of less than plus or minus 5/100 of 1 percent against an average net error of anywhere from —1½ percent to —6 percent in previous years. We find our meters are now coming in with no gum or dust, no sticky valves or bleached diaphragms, all of which have contributed to the rather poor showing of former years.

Expansion Creates Problems

With the increased emphasis placed on sales by all companies since the introduction of natural gas into New England and the resulting substantial increase in sales that we are enjoying, we are increasing our distribution problems.

Recently we tabulated some figures that bear out the fact that we are increasing our sales substantially (see Table 1).

These figures show rather clearly what has happened to seven New England companies that represent about 46 percent of the total New England meters, since the arrival of natural gas. During this same period, these companies increased their numbers of customers 3.2 percent. These increases are the result of some hard work and considerable sales expense by the New England gas utilities. Some figures for a number of straight-gas companies in Massachusetts (representing about 90 percent of the total meters) illustrate this point (see Table 2).

A correlation of the two charts indicates very clearly that this business of building a gas load through the merchandising of appliances is pretty much a dollars-and-cents proposition. These two charts offer concrete evidence that we in New England recognize that the business is here if we want to go after it. That is just what we have been doing!

Since much of this increase is due to heating, many companies are experiencing maximum days of more than double the maximum days in the year 1950 when we were serving a gas of about one half the Btu content. We have about used up the added main capacity gained by conversion to higher Btu gas.

Expansion Must Be Planned

My observation of the past lead me to believe that, with few exceptions, our predecessors sized our main extensions by some "rule of thumb." We can all recall cases where our legacy under the *Broad Thumb* has served us well under our expanding loads. Conversely we have seen where the *Narrow Thumb* legacy has called for expensive additional main extension work only too soon after the original installation was made.

TABLE 1. MCF Use Per Meter.
(1000 Btu Basis)

Co.	1950	1953	1954	1955	Percent change 1955 over 1950
A	28.2	38.1	44.1	50.1	77.7%
B	27.6	36.1	40.5	45.7	65.6%
C	32.1	35.7	38.8	41.1	28.0%
D	20.7	24.6	26.5	29.7	43.5%
E	58.6	50.5	59.3	73.0	24.6%
F	30.0	31.0	30.5	31.9	6.3%
G	47.2	31.2	39.4	46.0	—2.5%

TABLE 2 — Net New Business Expense
Straight-Gas Companies in Massachusetts
(Representing Approximately 90 Percent of Total Meters)

Year	Net new bus. expense	Number of meters	Aver. new bus. expense per meter	High	Low
1945	$ 589,293	727,948	$ .81	$1.54	$ .67*
1946	313,462	742,042	.42	.82	2.06*
1950	944,856	790,315	1.20	2.70	.00
1951	1,167,821	809,193	1.44	2.55	.05
1952	1,847,653	808,648	2.28	4.52	.18
1953	2,044,337	879,197	2.33	6.20	.36
1954	2,645,701	884,299	2.99	6.36	.56
1955	3,170,471	887,643	3.57	6.41	.48

*Profit

This comment brings to mind several rather graphic illustrations. We can all point to similar cases in our own companies:

One company in the early 20's was contemplating the installation of a main in a populated section of its territory. Even though a smaller pipe was indicated, someone in the organization insisted on a 30-in. main. Today, despite the fact that this company's business is 17 times what it was at that time, the line is still adequate.

The other case concerns a situation where, about 15 years ago, when times were hard in the gas business and the tendency was to practice the utmost in economy, a 6-in. high-pressure main was run to supply a growing area. Several years ago, it was necessary to parallel this line with an 8-in. high-pressure line to handle the requirements of the area.

Twenty years ago, the average cost of laying 4, 6 and 8-in. steel pipe was $.85, $1.45 and $3.60 per foot respectively. Today these costs are $3.60, $4.70, and $8.90 per foot. The point to emphasize here is that the main capacity built even 20 years ago is, by today's comparison, very inexpensive capacity. A quick look at the present general trend of the economy of this country should be all that is needed to convince anyone that the dollars we spend today on mains will, barring a prolonged major depression, be inexpensive capacity in 1977.

Vigilant Planning Needed

The changing character of our modes of life, our communities and our business requires a constant vigilance and planning for the future. How many of us, 30 or even 20 years ago, foresaw the tremendous acceptance for gas heating we are enjoying today? How many of us foresaw the trend to urban living? We have estimated that 50 to 60 percent of our present load is sold on mains installed since 1922 and I dare say this percentage is on the low side.

To plan effectively for the future requires considerable information together with the ability to apply this to the happenings of the past. Accurate perpetual inventories of appliances connected on our lines together with a constant and continuing load study of our systems is a must if we are to leave to our successors an adequate, well-balanced, distribution system.

No "Secrets" Today

Recently, I was looking through some proceedings of one of the associations that was a forerunner of the NEGA. "Operating secrets" as such were conspicuous by their absence. They really were "secrets" in those days. Today, we are most fortunate to be the beneficiaries of an era that started some 30 years ago, about the time the NEGA was established in 1926. Today, in New England, in particular, and in the country, generally, there is in our industry a free and most constructive exchange of experiences and ideas. Many have taken an active part in NEGA's division, group, and committee meetings. As a result, you have discussed and solved many of the industry's as well as many of your own problems.

On May 3, 1956, at the NEGA Operating Division meeting in Providence, we had an opportunity to hear, first hand, of the development of a new device for the gas industry — the infra-red gas analyzer. Earl Thomas of Consolidated Edison Company, New York, laid the facts before the group. Today, despite the fact that this is a patented device, any utility in the country can be licensed without fee to use it. This is certainly a far cry from the old days of secret processes being closeted behind high brick walls.

I learned recently that a group of New England gas utilities is planning a co-operative $110,000 venture wherein these utilities will jointly purchase and operate a network analyzer. This equipment is to be available for use by the participating companies for studies of their existing distribution systems and projected extensions which they may be contemplating. This type of cooperative project would not even have been suggested 25 or 30 years ago.

Emphasis on PAR

Nationally, we have witnessed great strides in our joint efforts to improve operations, methods, promotions, and appliances. Ten years ago, for the year 1947, the PAR fund of AGA — to which the vast majority of us contributes—allocated $456,922 for research. The estimated figure was $1,545,000 for 1956. The 10-year period thus shows a significant increase of 238 percent.

As a result of these substantial annual research expenditures, we have received much knowledge and have seen many advantages accrue to the industry. This covers a wide range of subjects from utilization, interchangeability of gases, burners and accessories, automatic-range ignition, ranges and cooking, water-heating research, heating and air conditioning, industrial and commercial applications, pipeline problems to manufactured-gas production.

During this period, something over 120 studies have been sponsored by the PAR Committee. Bulletins, reports, and papers have been issued on these studies. They deal with the industry's problems from the pressure in the bottom of the natural-gas well to the draft in the customer's chimney.

Karl Nagler has aptly described them as follows. "Some of the publications report on fundamental research — the text and reference book for tomorrow's developments; many are informational, filling in areas where there is little or no dependable knowledge; most are practical answers to the gas industry's problems. Some are manuals that give how-to-do-it information for the builder and architect; others are specifically pointed at helping the appliance serviceman."

This is truly a most worth-while achievement for our industry.

NEGA's Contributions

I also feel that we can look with considerable pride upon our own NEGA's contributions to developments and achievements at a regional level.

As I look back over the years, the cooperative approach to our various company problems, which was greatly stimulated by the formation of the NEGA in 1926, seems quite in keeping with the trend of the times.

It seems quite apparent the NEGA has made available to New England men an increasingly broad and well-planned opportunity for profiting from the cooperative or mutual approach to daily working problems. Not only have there been about 35 division and group meetings every year to consider a wide variety of problems, but NEGA has conducted many schools or courses over the years, starting in 1926 when the association was formed.

Engineering — customer service — safety — customer relations — and sales covering the commercial, industrial, and residential areas. And now, NEGA is planning a middle-management training school. Who would have guessed this "strange" development 30 or 20 or even 10 years ago? Who would have dared to imply that the chief assistants or the right-hand men of our gas-utility managers needed to be "educated?" A subject for possible scorn and perhaps even derision in 1926.

It is through many such activities over the years that we have improved our usefulness to the communities which we serve and have been able to accomplish, with a minimum of inconvenience, the changes which have occurred in our industry over the years.

Acknowledgment

This article was developed from a talk given by Mr. Faulstich before the NEGA Operating Division Meeting in Boston, January 23, 1957. ★ ★ ★

F. H. Faulstich

E. G. Rhodes

NEGA annual meeting prompts the thought that

'Progress' Is A Most Important Product of New England's Gas Industry

Dean Hale, *Editor*

ONE of the cornerstones of the structure of success in the gas utility industry today is the exchange of information and ideas among the men who keep the industry functioning.

In Boston this month, an outstanding example of this continuing exchange takes place as members of the New England Gas Association gather in the Statler Hotel for their 31st annual meeting. Here, in conference rooms, around "round tables," and in the halls and hospitality rooms, gas utility men from New England will assemble on both large and small scale, talking over and assisting each other in working out problems.

Long one of the outstanding regional gas associations, the NEGA brings together men from all phases of the gas industry under one roof for serious discussion and cordial hospitality. Working together on mutual interests, a parade of New England gas men has produced "progress" for their industry for over three decades.

The more than 300 companies they represent have a vital interest in their industry's progress.

For in this six-state area — Maine, New Hampshire, Vermont, Rhode Island, Massachusetts, and Connecticut — are some 1,600,000 gas customers, who in 1956 used more than 65-billion cu ft of gas and accounted for total revenues of more than $140,000,000.

Statistically, these figures are impressive, the six-state area represented by NEGA is only about 2.5 percent of the total U. S. land area, (smaller than the state of Missouri,) yet has over 6 percent of the nation's population and over 5 percent of its gas customers.

Effective utilization of the talent and manpower at its disposal is found in NEGA's organizational setup. Closely aligned with the membership's daily working interests are the five divisional groups: Accounting, Commercial-Heating-Industrial, Manufacturer-Distributor, Operating, and Residential Sales.

While the highlight of each year's activities is in the annual meeting, it is in the 40 or more divisional meetings held around the calendar that NEGA's members get down to brass tacks. Divisional meetings—in the form of clinics, round-table conferences, half-or-full-day affairs—whatever the format, they provide an opportunity for the specialized interest to thrash out problems and to help each other.

Behind all this effort is the man who holds the most important job in the New England gas industry, the managing director of NEGA, Clark Belden. A quarter-century veteran of the association, Belden is the man responsible for coordinating all of these activities into orderly form, making sure that every interested party is told of each forthcoming meeting, keeping tab on what each group is doing, and constantly making arrangements for the succession of events.

Historically, the New England Gas Association dates back to 1871, making it one of the oldest — if not the oldest — of the many associations in which gas utility men have bound themselves for betterment of their industry. (The predecessor of the American Gas Association was founded in 1873.)

Today's NEGA, with over 1300 individual members and 320 company members, is a far cry from the small group of gas engineers from various parts of New England who banded together to form the New England Association of Gas Engineers.

In purpose, the first "Engineers" group and today's NEGA are both alike and unalike. Today the emphasis is on sales and service, while technical problems were the chief interest of the founders of the engineers' association. Both, however, were formed to better their industry.

The New England Gas Association, founded in 1926, developed from an amalgamation of several gas men's associations. In addition to the NEAGE, there was The Gas Sales Association of New England, founded in 1917 as a medium for the exchange of sales ideas, and the Industrial Gas Association of New England, formed in 1923 to emphasize the need for better trained industrial gas men and better equipment for industrial utilization.

These three organizations merged on February 25, 1926, establishing the New England Gas Association, with F. C. Freeman of Providence as the first president. At the end of Freeman's term in 1927, the membership included 54 gas companies, representing 85 percent of New England's meters, 47 manufacturing companies, and 673 individual members.

Membership now includes 59 gas utilities, including five municipal gas departments, nearly 250 manufacturing, distributor, and associate companies, and over 1300 individual members. Over 300 of these individual members have "multiple memberships," — two or more divisions.

Success of the New England Gas Association can be summed up in a few words that cover a lot of territory: Cooperation on the part of all concerned. It's not an easy job, as anyone connected with the gas utility industry will "amen," but in New England, they work at it.

A. W. Johnston

Otto Price

H. C. Moore, Jr.

Clark Belden

31st Annual NEGA Meeting

March 21-22, 1957—Hotel Statler, Boston

Program

Thursday Morning — March 21

Election of Officers and Directors

The Association's Year, Clark Belden, managing director, NEGA.

Address By NEGA President, Fred H. Faulstich, vice president, Springfield Gas Light Company.

So You Think You're Slipping? Edward McFaul, teacher and lecturer, Chicago.

Thursday Afternoon — March 21

PUBLIC RELATIONS PANEL — **What is a Good Public Relations Job?**

Chairman—Horton L. Chandler, assistant to the president, New England Gas & Electric Association; *Members* — Walter G. Barlow, vice president, Opinion Research Corporation, Princeton, New Jersey; Eugene F. Martin, vice president, Carl Byoir & Associates; Remick McDowell, vice president, The Peoples Gas Light & Coke Company, Chicago.

OPERATING PANEL — **Natural Gas in New England — Past and Future**

Chairman — Hall M. Henry, vice president and director of gas operations, NEGEA Service Corporation; *Members* — Donald M. Ballou, superintendent, gas division, City of Holyoke Gas & Electric Department; Harold M. Kopp, gas engineer, The Connecticut Light & Power Company; John L. Turnan, manager, plant and transportation, Worcester Gas Light Company.

Friday Morning — March 22

NATIONAL GAS INDUSTRY PANORAMA, Chester S. Stackpole, managing director, AGA, Master of Ceremonies.

All-Year Air-Conditioning Sales Possibilities, Leon Ourusoff, Washington Gas Light Company.

What PAR Means to Our Industry, Allen D. Schrodt, director of PAR Plan, AGA.

What TV Means to Our Industry, Frank H. Trembly, director of sales, Philadelphia Gas Works Division, UGI.

Greetings, Julia Meade, commercial commentator for AGA TV series.

Double Dividends From Your Advertising, Thomas H. Lane, Lennon & Newell, Inc., (AGA's advertising agency).

Remarks by GAMA President, Julius Klein, president, Caloric Appliance Corporation.

What Is the Future for Gas Ranges? Cecil M. Dunn, president, Magic Chef, Inc.

Modern Ways to Promote New Gas Appliances Locally, Harold Massey, managing director, GAMA.

Remarks by AGA President, C. H. Zachry, president, Southern Union Gas Company.

Friday Afternoon — March 22

ACCOUNTING PANEL — **Long Range Planning**

Chairman — Wallace A. MacDonald, assistant treasurer, The Hartford Gas Company: *Members* — Burdette A. Johnson, comptroller, NEGEA Service Corporation; Otto Price, vice president, Boston Gas Company; Gilbert J. Williams, executive vice president, The Connecticut Light & Power Company.

SALES PANEL — **The Job Ahead—Ceilings Unlimited.**

Chairman — Wilbert L. Miller, sales promotion manager, Gas Division of NEES; *Members* — Harold E. Ayer, vice president and general manager, Lynn Gas & Electric Company; Frank R. Barnitz, assistant manager, new business department, The Brooklyn Union Gas Company; Herman Koester, Jr., president, W. Wirt Young & Associates, Inc.; Roger G. Stillman, New England division manager, Caloric Appliance Corporation.

F. R. Buckbee, Jr.

E. G. Silven

R. G. Stillman

D. M. Ballou

E. A. Bulpett

1956-57 NEGA Officers

(Serving through March 31, 1957)

New Officers will be elected on March 21 to serve for the 1957-58 fiscal year.

President: Fred H. Faulstich, Vice President, Springfield Gas Light Company

1st Vice President: Edgar G. Rhodes, President, The New Britain Gas Light Company

2nd Vice President: Andrew W. Johnston, Vice President in charge of Gas Operations, Boston Gas Company

Treasurer: Otto Price, Vice President in charge of Accounting, Boston Gas Company

Assistant Treasurer: H. Coleman Moore, Jr., Vice President & Treasurer, NEGEA Service Corporation

Managing Director and Clerk: Clark Belden

1957-58 NEGA Division Chairmen

(Will take office April 1, 1957 for one year)

Accounting Division: Frank R. Buckbee, Jr., Auditor, Blackstone Valley Gas & Electric Company

Commercial-Heating-Industrial Division: E. Gilbert Silven, Manager, Industrial & Commercial Sales, Providence Gas Company

Manufacturer-Distributor Division: Roger G. Stillman, New England Division Manager, Caloric Appliance Corporation

Operating Division: Donald M. Ballou, Superintendent, Gas Division, City of Holyoke Gas & Electric Department

Residential Sales Division: Ernest A. Bulpett, Merchandising Manager, Mystic Valley Gas Company

1956-57 NEGA Division Chairmen

(Will serve thru March 31, 1957)

Accounting Division: Wallace A. MacDonald, Assistant Treasurer, The Hartford Gas Company

Commercial-Heating-Industrial Division: Alfred E. Green, Executive Vice President, W. Wirt Young & Associates, Inc.

Manufacturer-Distributor Division: Roger G. Stillman, New England Division Manager, Caloric Appliance Corporation

Operating Division: John L. Turnan, Manager, Plant and Transportation, Worcester Gas Light Company

Residential Sales Division: Frank J. McLaughlin, Residential Sales Manager, Providence Gas Company

SEALED GASKET

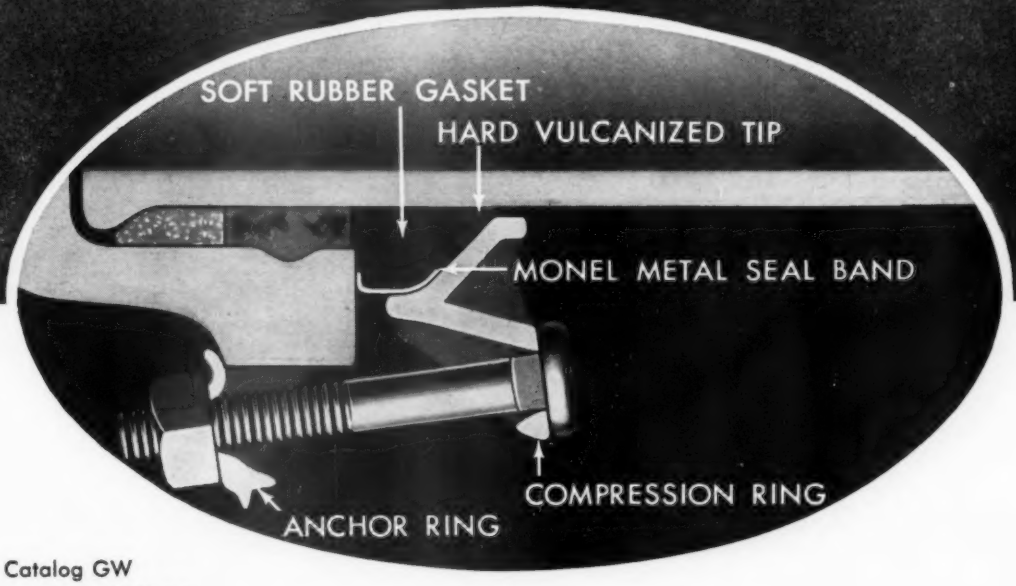
3/4" bolts! massive design!

Skinner-Seal Bell Joint Clamps stop bell and spigot joint leaks under pressure. Speedy, one-man installation cuts repair costs substantially.

Gasket is completely sealed and protected; at the bell face by a Monel Metal Seal Band*; at the spigot by hard, vulcanized gasket tip, acting as a plug. Equalized pressure forces gasket into every crevice in the joint, completely sealing the leak at its source.

Sturdy malleable iron Compression and Anchor Rings — shaped and pressure-tested before shipping.

Electro-plated, 3/4" high-tensile steel pull bolts are standard, but malleable iron bolts can be furnished at slight extra cost.



*If government requirements curtail availability of Monel, stainless steel will be substituted.

Write today for New Catalog GW

M. B. Skinner Co. • *Est. 1898* • **South Bend 21, Ind.**

SKINNER-SEAL BELL JOINT CLAMP

exhibit in-print

Gas Consumers will spend a Half Billion dollars on Laundry Equipment in 1957 —Here is the No. 1 reason

Gas Appliances for Laundry Automation

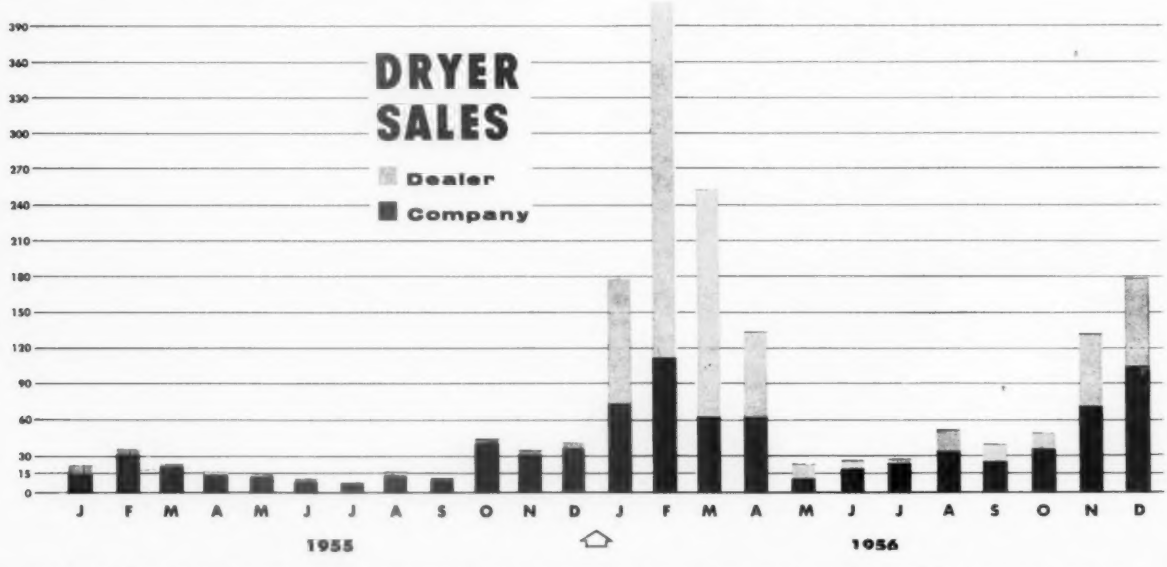
Ernestine Adams

YOU want the reasons for rising sales and increasing success of promotions in selling more gas appliances? The following pages reveal the most important reason why in 1956 sales of gas water heaters reached almost 3,000,000 and of gas clothes dryers were nearly 450,000, a 22 percent gain over the year before.

The modern gas water heater is an incredible automatic servant. Its fast heat gives constant hot water under normal conditions. Its controls are a perfect example of household automation.

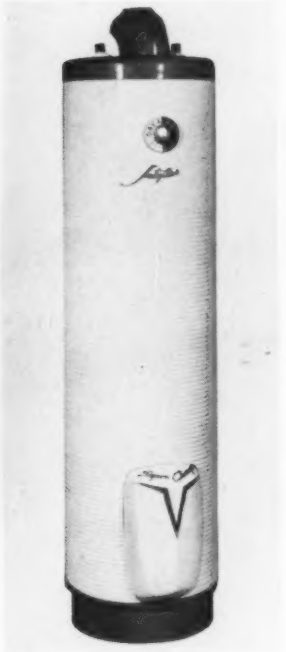
Gas clothes dryers are coming into their own with a bang. Five years ago, who heard of them? Now there are many designs, all attractive and all efficient. It's a market that's just begun and a boom's on.

Turn the pages for a handsome display of gas appliances your customers want.

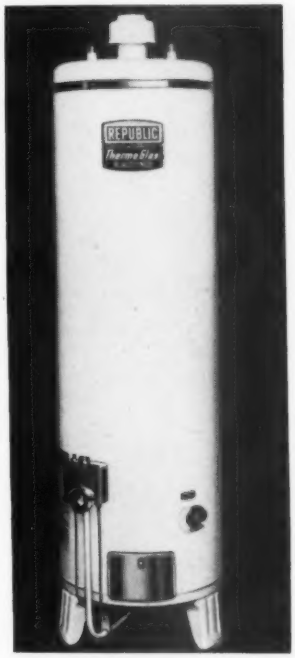


This South Jersey Gas Company graph of its monthly clothes dryers sales shows better than words the amazing increase in 1956 over 1955 and the sharp rise during promotion months. Dealers and company share gains.

MODERN GAS WATER HEATERS HAVE IMPROVED, SAFE AUTOMATIC CONTROLS



Day & Night Jetglas model heater has control cover. Day & Night Division, Carrier Corporation, 700 Royal Oaks Drive, Monrovia, California.



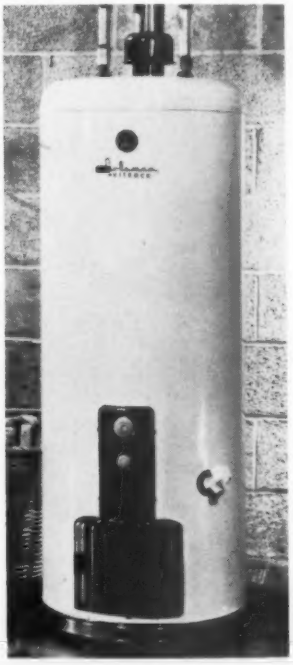
Thermoglas lined water heater. Republic Heater Division, Odin Stove Manufacturing Company, Huntington Park, California and Erie, Pennsylvania.

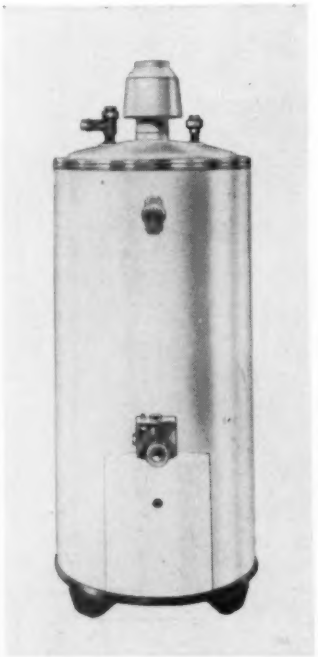
Toastmaster heaters are Lonodoglas lined. McGraw Electric Company, Clark Division, 5201 West 65th Street, Chicago 38, Illinois.

External flue surrounds tank in glass-lined or galvanized tanks. Mustee Heater Company, 3409 Superior Avenue, Cleveland 14, Ohio.

Saf-T-Glass is name for lining of this water heater. M. M. Hedges Manufacturing Company, Inc., 700 E. Main Street, Chattanooga, Tennessee.

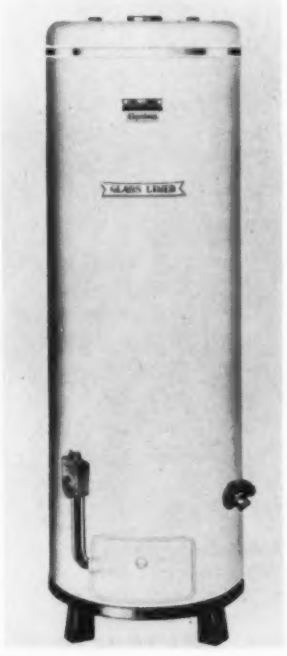
Vit-Rock has Blu-arch burner with V-type flame openings. Coleman Company, 250 North St. Francis Street, Wichita, Kansas. Exclusive Vit-Rock liner is selling point.





Rex has extra heavy galvanized tank (also glass-lined model). Cleveland Heater Company, 2310 Superior Avenue, Cleveland 14, Ohio.

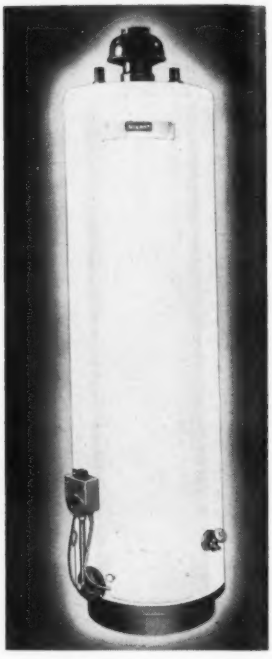
Keystone glass-lined water heater complements Crane galvanized heaters. Crane Company, 836 So. Michigan Avenue, Chicago 5, Illinois.



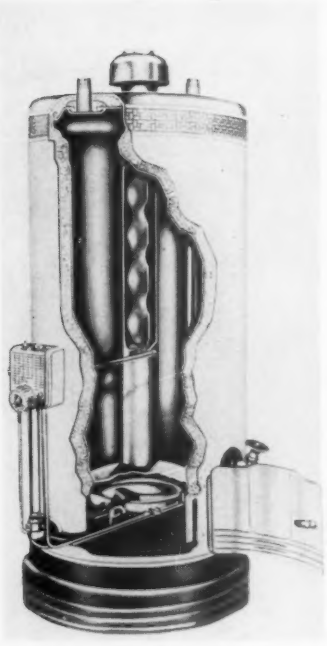
NEW DESIGN AND COLOR MAKE HEATERS MORE CONVENIENT AND ATTRACTIVE

Cabinet-shaped with color accents at top and bottom that can be changed to fit the room decoration. Rheem Manufacturing Company, 7600 S. Kedzie Avenue, Chicago 29, Illinois.

High or low recovery models in glass-lined table top with removable front panel. Waldorf Heater Company, 1421 Chestnut Street, Philadelphia 2, Pennsylvania.

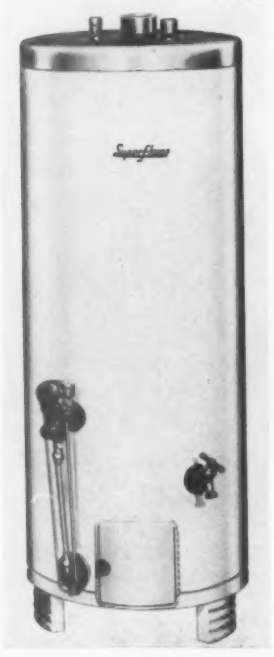


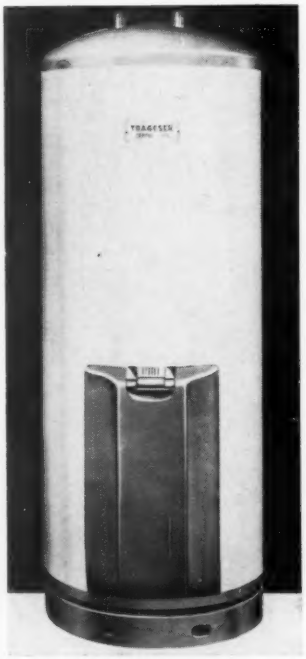
Model 148 is popular design with ring base. Bryant Manufacturing Company, 2020 Montcalm Street, Indianapolis 7, Indiana.



Bradford glass-lined squat-type automatic heater. Pennsylvania Range Boiler Company, 24th and Ellworth Streets, Philadelphia 46, Pennsylvania. Cutaway shows flue.

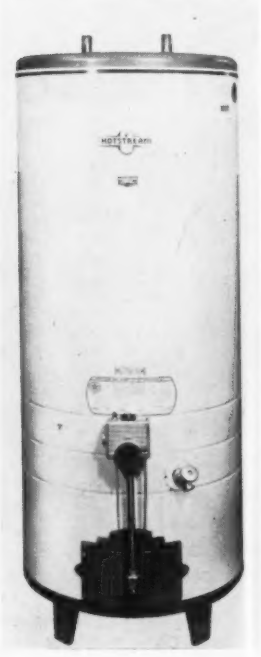
Superflame water heater has off-center flue with removable 5-stage flue baffle. Queen Stove Works, Inc., Albert Lea, Minnesota.



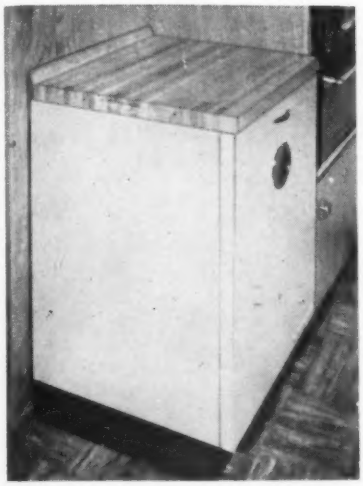


"Copper Core" and "glass core" indicate heater linings. Trageser Copper Works, Inc., International Airport (Idl.), Jamaica 30, New York.

Adjustable two-temperature water in stone-lined heater. Hotstream Heater Company, 2363 E. 39th Street, Cleveland 4, Ohio.



THICK INSULATION IN NEW TANKS REDUCES HEAT LOSS, KEEPS CASING COOL

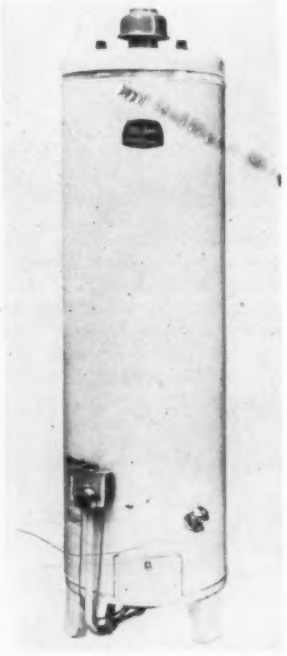


Carving block is available for table top water heater. Continental Water Heater Company, 1801 Pasadena Avenue, Los Angeles 31, California.

Flue has cast iron heat retarders. Cylindrical models also. John Wood Company, Heater and Tank Division, Conshohocken, Pennsylvania and Chicago, Illinois.

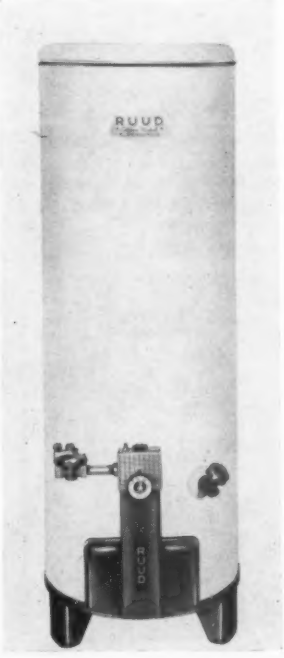
White porcelain table top gives extra work space at convenient height. "Hi" or "Lo" input models. Handley Brown Heater Company, Jackson, Michigan.

Specifications for These and Other Gas Water Heaters will be Published Next Month



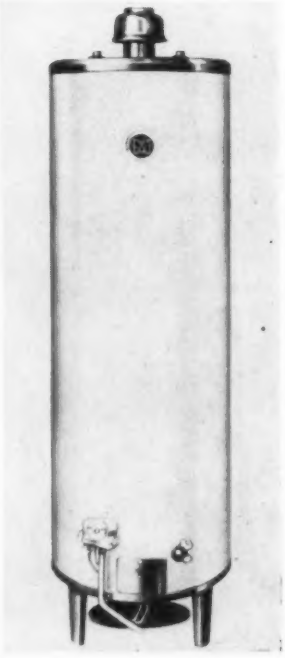
Glass/Guard series made by tight uniform glass-to-steel fusion. Dearborn Stove Company, 1700 W. Commerce Street, Dallas, Texas.

Copper Nickel Superspeed has single or two-temperature operation. Ruud Manufacturing Company, Kalamazoo 24, Michigan and Toronto 14, Ontario, Canada.



Midwest Blue Flame comes in eight decorator colors for all models. Midwest Heater Company, 3222 Manderson Street, Omaha 11, Nebraska.

Diamondglas lining is fired and fused to thick gauge steel tank. Mission Appliance Corporation, Hyde Park Station, Los Angeles 43, California.



Top loading gas clothes dryer is white enamel with copper trim. It is completely automatic; drys an 8-lb load of wet clothes; has ¼-hp electric motor, and high velocity fan (over 140 cu ft of air per minute). Dimensions: 30 in. wide, 36 in. high, 26 in. deep. Btu input, 23,000.

Fowler Manufacturing Company, Portland, Oregon.

RCA Whirlpool dries a 20-lb load in 27 min. Available in white, pink, yellow and green. It has ⅓-hp motor; 29 in. width, 25½ in. depth, 42½ in. height; uses 37,000 Btu per hr gas input. Has ultra violet lamp, built-in lint screen.

Whirlpool-Seeger Corp., St. Joseph, Michigan.

Air-flow gas dryer, completely automatic, has a door that swings back against front of dryer for convenience in loading and removing clothes. Height 42¾ in., width 31½ in., depth 27 9/16 in. Has 1/6-hp motor.

Maytag Company, Newton, Iowa.

Automatic, one-knob control utilizes principle of low temperature and high volume of air. Load capacity is about 18 lb of wet clothes with drying cycles of up to 90 min. Height 39 7/16 in., 26 in. depth, 30 in. width. Gas input 20,000 Btu.; motor ⅛ hp.

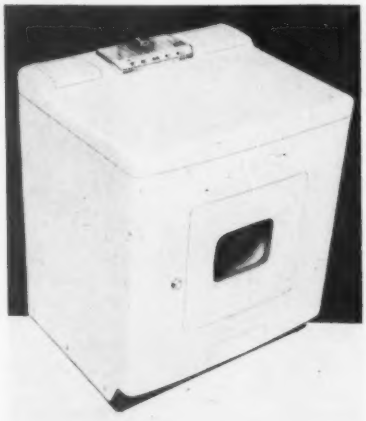
Caloric Appliance Corporation, 12 South 12th Street, Philadelphia 7, Pennsylvania.

Dryer with "Touch and Go" controls is a white cabinet accented in gold and silver. It has a Sun-E-Day ultra violet lamp. Over-all height 42⅜ in., 31 in. wide, and 27½ in. deep. Washer load of 9 lb; has 1/6-hp motor and 18,000 Btu input.

Hamilton Manufacturing Company, Two Rivers, Wisconsin.

This gas dryer has a turbine-type blower called "Mistaway" which operates very quietly. Knee-high push button allows easy opening of door. Operation controlled by one dial that permits up to 120 min. of operation.

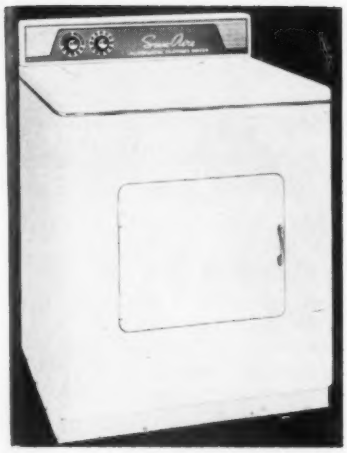
Temco, Inc., Nashville, Tennessee.



Automatic gas ignition system; Wet clothes are loaded in tumbler, door closed, and automatic timer control set. Is 40 in. high, 31 in. wide, 33½ in. deep; capacity 18 lb wet, 9 lb dry. Vent kit of one hood and 5-8 ft of flexible duct available.

Geo. D. Roper Corp., Rockford, Illinois.

exhibit in-print



Sun-Aire automatic clothes dryer has a blower that provides 125 cu ft of air per minute. Measures 41½ in. high, 30 in. wide, 25 in. deep; ⅓-hp motor with built-in overload protection, and 20,000 Btu input.

Stiglitz Corporation, 2007 Portland Avenue, Louisville 3, Kentucky.

The Blackstone Model 193 gas-operated dryer matches Royalist automatic washer of same company. Both come equipped with either stainless steel top or with baked white enamel top. Like all other washers in this display, dryer is automatic.

Blackstone Corporation, Jamestown 6, New York.

This Wedgewood dryer does two drying jobs at once: One in a gentle dry compartment and the other in a regular tumbler drying opration. Dimensions: 41⅜ in. high, 30 in. wide, 25 in. deep. A large clothes port permits easy loading and unloading of clothes. Heat input, 22,500 Btu.

Rheem Manufacturing Company, 7600 South Kedzie Avenue, Chicago 29, Illinois.

A housewife may tumble-dry with heat, tumble-dry with air, or dry with heat and no tumbling, or air and no tumbling in this dryer. Stands 42 in. high, 25½ in. wide, 26¾ in. deep; has 1/3-hp engine. Filters and saves hot sudsy wash water from first to second washing.

Norge Division of Borg-Warner Corporation, Merchandise Mart Plaza, Chicago 54, Illinois.

Counter-style top on Universal adds working space for folding and stacking clothes. Tumbler opening is 11¾ in. diam. Has 15,000 Btu input per hour with automatic safety pilot; a 1/3-hp motor. Dimensions: 28 in. width, 25½ in. depth, over-all height 40¼ in.

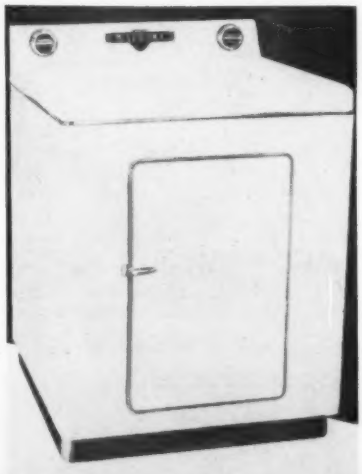
Cribben and Sexton Company, 700 North Sacramento Blvd., Chicago 12, Illinois.

Douglas deluxe automatic gas clothes dryer carries 20 lb wet or 10 lb dry load. Depth, 25 in. and width, 28 in. Lint trap directly below loading door.

Pennsylvania Range Boiler Company, 24th and Ellsworth Streets, Philadelphia 46, Pennsylvania.

Automatic gas clothes dryer has three-stage temperature control. Height 40 in., width 28 in., depth 24 in.; ⅓-hp motor. Capacity up to 20 lb wet. Constant heat input, 15,000 Btu or more.

Waldorf Heater Company, 1421 Chestnut Street, Philadelphia 2, Penna.



AMERICAN
Gas Fundamentals
NATURAL GAS
A CONTINUING EDUCATIONAL AND REFRESHER COURSE IN
GAS TECHNOLOGY — OPERATIONS — EQUIPMENT — MANAGEMENT — UTILIZATION

Geology and the Gas Industry

IN the study of his fascinating universe, man has classified his investigations for convenience. That area of examination which is of the earth, including the materials of which it is made and their history and arrangement, has become known as the *science of geology*. Being a sectional study of nature, all of the other sciences, such as physics, mathematics, chemistry, biology and botany, contribute to a blend that enables geology to interpret the story of the earth and its rocks.

Two of the elementary discoveries of geology have influenced the development of specialized branches of study. First, it was learned that the earth has been undergoing constant change since its creation. The crust of the earth, particularly, has been under stress and strain from the physical forces generated by gravitational pull, heat, cold, rain, water, wind, and all the other combined dynamic elements of nature — as when a mighty flood rips mountains and hills to carry material for the fertile delta plains of tomorrow.

The history of creation and change over millions and trillions of earth life years will always engage the intense curiosity of the geologist. The mental reconstruction of conditions existing at specific moments in the dim past provides the practical means of finding the subterranean treasures of the earth.

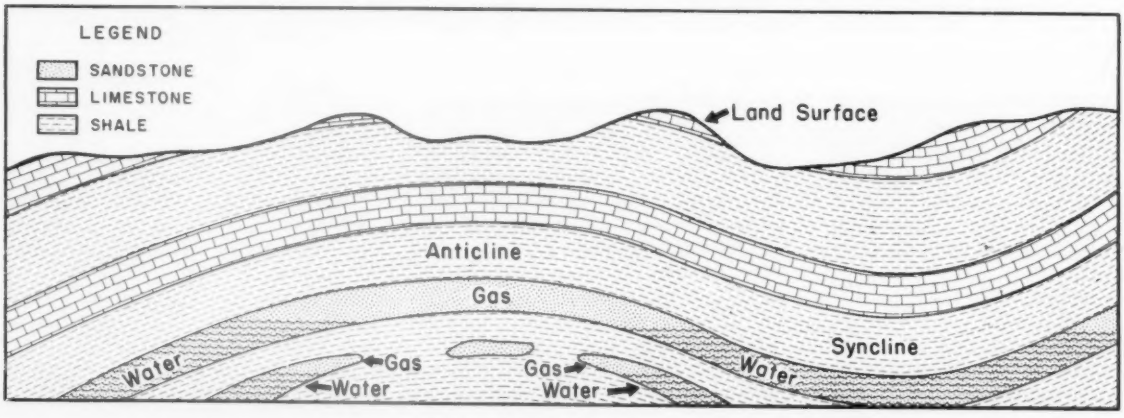
The tablet of rocks, on which the earth's history is written, is composed of three predominant groups. First, and probably the oldest, are the *igneous rocks*, which solidified from a primary molten state. Second, are the *sedimentary rocks* which are the products of erosion, transportation and deposition of small rock and organic particles. *Metamorphic rocks*, which comprise the third group, are formed from igneous or sedimentary rocks that have been altered by the chemical and physical reactions from high temperatures and pressures. Each of these classes of rock is significant in the quest for gas and oil and each group inspires specialization in the search.

Geology is very much concerned with the present. It seeks to know the reason for every structural feature — of every variation in the earth's surface. The "whys" and "hows" of the formation and being of plains, canyons, mountains, valleys, plateaus, escarpments, volcanoes, geysers, dunes, deltas, seas, and shores are dilligently sought. Geography wants to know where these things are on the globe. But geology seeks to know how they came to be.

Such knowledge of current earth features enables geology to reach backward in time and reconstruct buried landscapes on the basis of evidence furnished by the rocks. It determines the "geography of the past." During many geological periods (measured in millions of years) the location of seas and continents and their corollary features varied greatly. Areas now occupied by land masses were often submerged beneath ancient oceans. The ice caps of the poles have varied in thickness and extent through the ages so, at times, places now quite habitable were once frozen wastes. Streams were smaller or greater; their courses different. Volcanic action fluctuated. The study of such occurrences and their causes is the interest of the structural geologist.

Plant and animal life flourished or declined during

PRINCIPAL STRUCTURAL CONDITIONS FAVORABLE FOR THE ACCUMULATION OF NATURAL GAS



Accumulation of Gas, Oil, and Water on Anticlinal or Domal Type Structure

geological ages in relation to the ability to adapt to changing environments. Because of this existence and distribution of ancient forms of life, the geologist is able to relate sedimentary rocks to the geological age of their deposition. The remains of life forms in the rocks are called *fossils*. At various times, in the past, certain types of life reached their zenith in abundance and distribution over the earth. Their remnants are referred to as *index fossils* because they serve to relate rocks of the same age. The geologist who studies these fossils is termed a *paleontologist* and the branch of the science is known as *paleontology*.

There are also others who are concerned with specialized aspects of geology. And from all of them, from the student of the earth's origin, the mineralogist, the paleontologist, and the geo-physicist, come contributions to the search for gas and oil.

Origin and Migration of Gas and Oil

There are many theories as to how and why oil and gas were created and accumulated in the earth. Some believe that heavy metal carbides were contained in the interior of the earth at one time and that the reaction of such carbides in contact with subterranean waters produced hydrocarbons (oil and gas). Others believe that the natural distillation of buried and decayed animal and/or vegetable matter produced oil and gas. A variation of this theory attributes the development of petroleum hydrocarbons to the decomposition of immense quantities of algae present in ancient seas. Large numbers of scientists today believe that hydrocarbons may have originated from both vegetable and animal decomposition.

An important corollary to the speculation on the origin of gas and oil is a widely held theory that hydrocarbons were developed in source beds of shale and migrated to occupy their present positions in sandstones or limestones. This theory is partially supported by the presence of oil bearing shales in traceable connection with accumulations of oil and gas. Many geologists consider the presence of shale beds to be a prerequisite to considering an area favorable for drilling in the search for gas and oil.

It is known that gas and oil do migrate. This movement is made possible and controlled by the physical construction of rocks. Some rocks are *impervious*, like a sheet of glass, and will not permit fluids or gases to pass through them. Others are *pervious* and allow gas and liquids to pass.

Rocks are composed of small individual grains compressed together into a homogeneous mass. Since these grains are largely round in shape there is considerable space unoccupied between them. To visualize this, imagine a bucket of marbles as a magnification of a piece of rock. The amount of space between the grains of the rock govern the amount of gas or fluid that can be contained in the rock and is known as *porosity*. The ease or difficulty with which gas or liquid flows through such pores indicates the relative permeability of the rock.

The capacity of rocks to contain considerable quantities of gas and/or oil within the *pores* or *interstices* of the rock explains where petroleum or natural gas is found in nature. Because these accumulations have been referred to often as "pools," the erroneous idea that lakes or streams of oil and gas occur underground has developed. Only in very rare cases, as in certain subterranean crevices discovered in Mexico, is gas or oil found in solid bodies.

These valuable products of the earth are found not only as contents of the rocks but they have to be extracted, sometimes with extreme difficulty, from the formations which they impregnate. The mere presence of hydrocarbons does not make a commercial well as the porosity and permeability have to be of such a nature as to permit their extraction or production at a cost low enough to make the operation profitable.

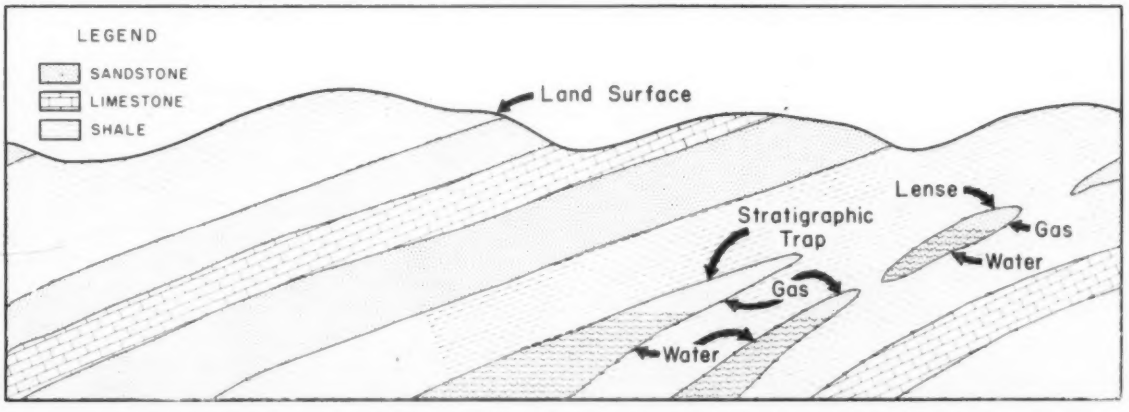
Entrapment of Gas and Oil

Natural gas and oil in their migrations tend to move *updip* or upwards through the earth's formations covering them. Gas is, by nature, lighter than air and consequently seeks a higher position. Water within the earth also displaces gas and oil forcing both above the level of the water. The weight of tons of rock overburden create pressures that add to those already generated in the formation of gas and oil. The upward movement, due to these various forces, continues until the route of movement is blocked.

Such blocks are referred to as *traps* and by such entrapment are created the *pools* or *reservoirs* of gas and oil that we find or seek to find. If the hydrocarbons are not trapped they may escape on the surface of the earth and it is believed by many scientists that great quantities of these products have been lost to humanity in this manner.

The blocks that create traps are impervious rocks. Hydrocarbons traveling upward arrive at a high point

PRINCIPAL STRUCTURAL CONDITIONS FAVORABLE FOR THE ACCUMULATION OF NATURAL GAS



Accumulation of Gas, Oil, and Water on Monoclinal Structure Due to Stratigraphic Trap and Lensing

of no return where they encounter rocks of such density as to be impenetrable. The arrangement of such traps are referred to by the geologist as "structures" and "closures."

A simple example of a trap or structure may be formed by forcing the cupped palm of the hand downward into a vessel of water. If the hand has been held tight and steady, a small quantity of air will have been trapped under the water. The spreading of a finger will release the air in the same manner gas is released by a well penetrating an impregnated structure.

The geological equivalent of the example of the hand would be called an *anticline* or *anticlinal structure*. The reverse of this form, as when the palm of the hand is held upward, is a *syncline* or *synclinal basin*. Both of these types of structures are shown in the accompanying illustrations of examples of conditions favorable for the accumulation of gas and oil.

The variety of structural conditions favorable for entrapment of hydrocarbons makes it difficult to present more than a few of the principal forms under relatively ideal conditions. The illustrations can give a distorted idea unless it is borne in mind that the flat cross sections indicate accumulations of gas and oil that do not continue infinitely along a projection up and down from the page but are also stopped at these ends by blocks or "closures." The ability to accurately visualize the nature and extent of structures within the earth, on the basis of available information, is one of the chief assets of the exploration geologist.

Searching for Gas and Oil

Using the knowledge of structures that have produced gas and oil, the geologist seeks to find similar conditions that may be favorable. If the search is in new and unworked territory, known as *wildcat country*, a preliminary survey of the principal surface features over many square miles may be necessary. However, as much general geological work has been done in our country, the initial work may be accomplished in any good library housing the thousands of volumes of geological literature made available from previous studies. Even considerable amounts of detailed information may be found in this manner. After digesting the accumulated information, the more important facts are likely to be verified in the field.

Numerous shallow gas and oil fields were discovered from features discernible on the surface. The plane table, on which are mapped the outcrops and tilt or dip of the same rock strata to determine the contour of key formations, is the principal tool of the surface geologist. Maps developed in this manner make reference to the height above or below sea level by a plus or minus system. This is still a good and valid method of locating likely spots on which to drill for gas and oil. Unfortunately, the oil provinces of our country have been so carefully worked that the chances of discovering a virgin prospect with only surface methods is extremely unlikely.

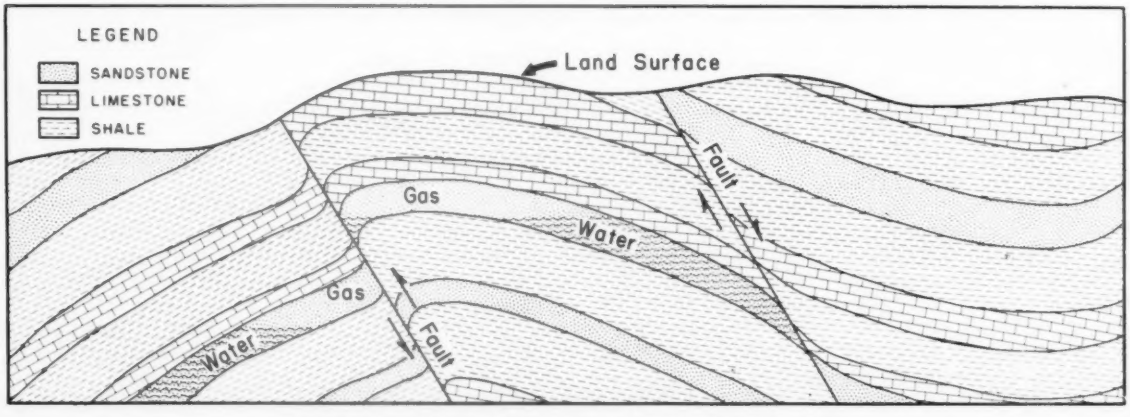
Since the surface discloses but few of the inner secrets of the earth, the geologist must use additional tools to probe for invisible possibilities. There are a variety of methods and instruments that will yield clues and they may be used singly or combined in a manner most suitable and economic for the immediate purpose.

Sub-Surface Mapping

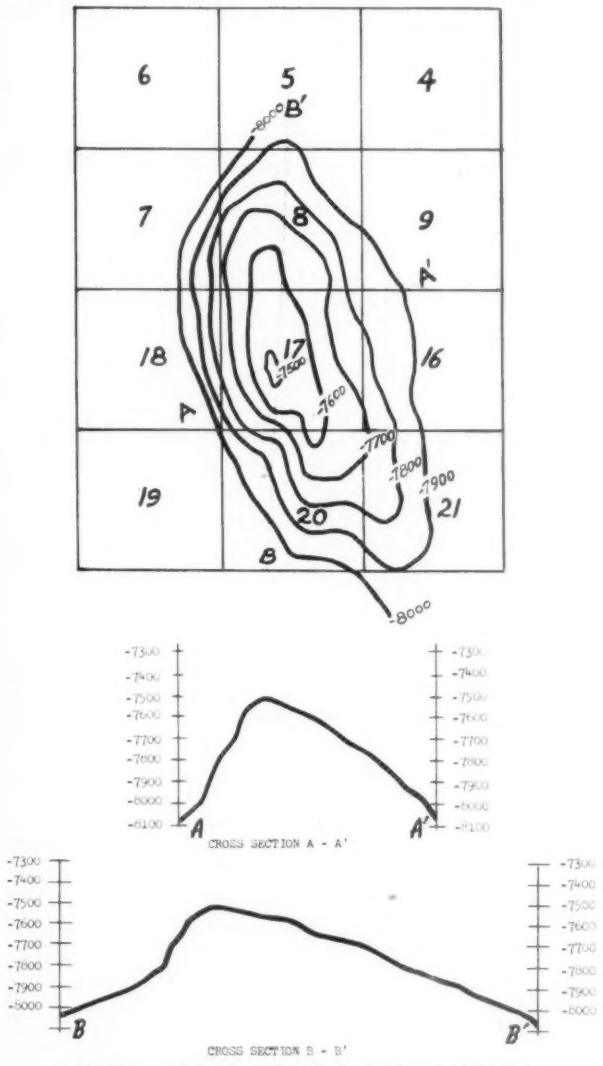
The most direct way of finding what is in the earth is through the information from a hole dug, drilled, or bored into the earth. The formations penetrated by any well drilled are usually carefully noted and made a matter of record. From these *logs*, as the records are called, the depths of a formation at various locations, relative to sea-level, are plotted and resulting positions are projected to create sub-surface contour maps. Some of this information may come from wells drilled specifically for this purpose as *core holes, geological test wells*, or *strat (stratigraphic) tests*. The formations are identified by rate of penetration and the physical characteristics and index fossils of the cuttings of the well. Additional information is obtained from *electrical logs* which may be run in the holes.

At any depth, electrodes may be lowered into a well. They emit continuous charges of electricity for the purpose of measuring the resistance of the materials in the hole wall. As an electric current will pass through various substances with more or less ease, a skillful interpretation of the results of such measurement, as plotted on the scaled log chart, reveal to the geologist the character of the formations penetrated and, to some extent, their contents. Water will conduct electricity much easier than oil, which is highly resistant, so the two are easy to detect if there are no complications due to the presence of rock with similar resistances.

PRINCIPAL STRUCTURAL CONDITIONS FAVORABLE FOR THE ACCUMULATION OF NATURAL GAS



Accumulation of Gas, Oil, and Water on Faulted Type Structure



To aid the determinations from the electrical log, there is usually run at the same time a measurement of the ability of the logged formations to develop minute amounts of electricity. This is called the self-potential side of the electric log and is used in conjunction with the resistivity curves to interpret what is down the hole.

Aerial Photography

In making wide scale geological surveys, *aerial photography* is frequently employed. This important tool often discloses significant surface indications of structural conditions that are almost impossible to conceive at ground level. The panoramic view permits an understanding of the widespread elements of structure that are related to the geological problem under consideration. Variations in the coloration of vegetation over wide areas, due to soil and mineral differences, build patterns in aerial photographs that become clues to areas most favorable for more detailed geological work.

Geophysical Methods

One of the most highly specialized branches of petroleum geology is that of applying the laws of physics to the study of the earth for the purpose of determining the location, shape, and extent of favorable structures within the earth. There are several of these methods in common use that have produced and are producing excellent results. All of them employ intricate and expensive apparatus capable of extremely sensitive measurements.

Since the density of rocks varies over the face of the earth, there are infinitesimal variations detectable in the gravitational pull of the earth from point to point. To measure these differences several types of instruments have been invented. The two most common are the *torsion balance* and the *gravity meter*. Through their use, sub-surface maps based on densities are constructed. Careful analysis and relationship to known conditions can result in usable outlines of possible structures that may be favorable for the accumulation of gas and oil.

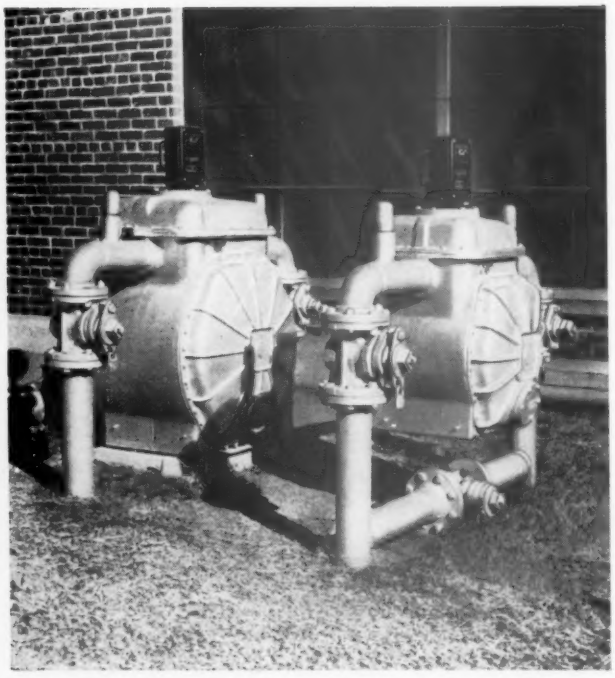
Closely related to the gravitational instruments is the *magnetometer*. This device is capable of recording (due to differences in the earth's crust) minute variations in the magnetic field surrounding our planet. These measurements are mapped and interpreted in terms of structural arrangement. The magnetometer is particularly effective where mineralization occurs. It has the further advantage of extreme portability with the result that large areas can be cheaply surveyed with its use. Furthermore, it is capable of accurate results while airborne, so it becomes an extremely advantageous tool for surveying wild and inaccessible regions. It may be detected in the air as a cigarlike appendage suspended below cruising aircraft.

Seismograph

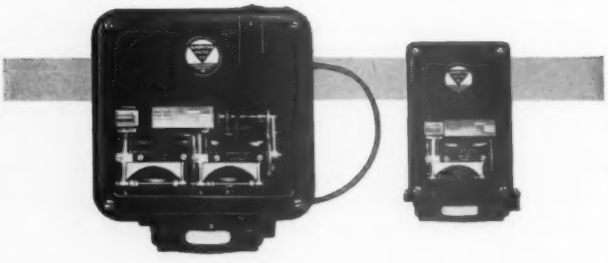
Serious use of the seismograph in the search for gas and oil began after World War I. Prior to that time, it was confined to laboratory usage for the recording of earth tremors. Extremely long range German guns, used during World War I, made their location for countermeasures a critical problem. It was found that the concussions from the discharge of these guns could be recorded on seismographic instruments and from that it was a simple step to calculating the time of receipt of tremors at multiple seismic stations for the purpose of pinpointing the location of the guns.

In adapting the seismograph for petroleum prospecting, two principal methods were developed. The *refraction system* has been largely superceded by the *reflection method*. Although there are technical differences in the two ways of employing the seismograph, both take advantage of the different velocities at which earth shock waves are transmitted through various kinds of rocks — due to the qualities of density and elasticity of the formations encountered. Earth shock waves travel about 6000 ft per second near the surface and increase in speeds at greater depths due to higher rock density from compression. This compares to the velocity of sound waves through the air at about 1100 ft per second.

In using the seismograph, explosions are set off on the surface to produce earth shock tremors. These shock waves are recorded as they are reflected or refracted from successive subterranean formations on very sensitive geophones located on a prearranged pattern of stations. The time between the explosion and the arrival of each succeeding echo is recorded and measured in thousandths of a second. The travel time at each station, from a particular formation, is calculated and translated to a map, from which the



Temperature and pressure compensated metering continuously and automatically



American® BASE VOLUME INDEXES register gas quantity at standard conditions of base temperature and base pressure. BASE PRESSURE INDEXES automatically multiply volume at pipe line conditions by the pressure factor and indicate quantity at base pressure on a straight reading index.

Operation of both instruments is continuous with all functions performed mechanically through special gearing. Indicated totals are always accurate.

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relative depth of the strata can be determined. This forms the basis for the discovery of likely structures.

As with all other geological tools, the seismograph is not useful everywhere but in the areas where it is effective it is extremely valuable. Numerous discoveries have been made possible through seismic methods in places completely devoid of surface clues. The exploration of our continental shelf and the resulting offshore wells would have been a very hazardous venture financially without the use of waterborne seismograph.

Geologist's Function in Drilling for Gas

The sum total of the geologist's value to the gas and oil industry is his ability to increase the chances of discovering new deposits. He cannot see into the earth nor has he the tools to tell him whether there is gas or oil below the surface without drilling. But, he does know a great deal about the nature of petroleum and where it is likely to be hidden. Using the best interpretation he can make of the vast and intricate knowledge available to him, he selects the site for drilling. To date, only the results from a hole, properly explored, in the earth will reveal the actual presence of hydrocarbons.

The geologist increases the chances of making a discovery and thereby stimulates the search for gas and oil. Without him, the chances of finding any commercially profitable hydrocarbons would rise from 10 to 1 to prohibitive odds. We would probably still be living in the coal age if we depended on chance to find natural gas.

When drilling has begun, it is the geologist who determines the objective to be reached by the drill bit and he is the man who feverishly watches the cuttings returned from the well to verify or alter his theories. Each foot drilled is carefully noted to determine the position and identification of the formations penetrated. For this purpose, services of the paleontologist are often required to prevent becoming geologically "lost." Indicative formations are said to be running "high" when they are encountered at relatively shallower depths than in known surrounding positions and "low" when the converse is true. When running "high," conditions are favorable and spirits mount accordingly. The geologist acts as a prognosticator for all concerned until he finally announces the objective has been attained.

Naturally, every geologist hopes to drill a discovery well on each wildcat location and a good well on all development work, but this does not always happen. It does not mean, however, that he has failed. He could have been absolutely correct in all his assumptions and all the data from his various tools could have been correct. He can find conditions favorable for the accumulation of gas and oil but he cannot put the gas and oil there. The presence or absence of hydrocarbons is an act of nature. And the internal architecture of the earth is but dimly discerned in spite of all our scientific know-how.

But even no failure, the geologist rises phoenix-like. From every well — successful or dry — more information is gathered to add to the sum total that makes ultimate discovery possible. From the geologist's standpoint, a good gas or oil well is a soul satisfying achievement but no well is a complete loss.

Acknowledgment

This chapter on *Geology and the Gas Industry* was prepared by Mr. W. K. Powell, President, Beard Drilling Company, Inc., Duncan, Oklahoma. ★ ★ ★

CALENDAR OF THE GAS UTILITY INDUSTRY

March

5- 6 Task Committee on standardization of meter purchase specifications, AGA operating section, Hotel Mark Hopkins, San Francisco, California.

7- GAMA automatic gas range conference, Barbizon Plaza Hotel, New York.

8 Southeastern Gas Association, accounting round-table conference, Selwyn Hotel, Charlotte, North Carolina.

11-12 AGA residential gas sales committee, residential gas section, Roosevelt Hotel, New Orleans, Louisiana.

11-14 National Electrical Manufacturers Association, Edgewater Beach Hotel, Chicago, Illinois.

11-15 National Association of Corrosion Engineers, Kiel Auditorium, St. Louis, Missouri.

18-21 ASME gas turbine power conference, Sheraton-Cadillac, Detroit, Michigan.

21-22 NEGA, annual meeting, Hotel Statler, Boston, Massachusetts.

25-27 Mid-West Gas Association, Hotel Nicollet, Minneapolis, Minnesota.

25-27 AGA general management section, Edgewater Gulf Hotel, Edgewater Park, Mississippi.

25-29 American Society for Metals, 10th western metal exposition and congress, Pan Pacific Auditorium and Ambassador Hotel, Los Angeles.

28-29 Oklahoma Utilities Association, annual convention, Tulsa Hotel, Tulsa, Oklahoma.

29 Southeastern Gas Association, transmission and distribution round-table conference, King Cotton Hotel, Greensboro, North Carolina.

April

2- 4 University of Oklahoma Corrosion Control Short Course, Extension Study Center, Norman, Oklahoma.

8-10 National conference of electric and gas utility accountants, Sheraton-Park Hotel, Washington, D. C.

8-10 GAMA annual meeting, The Greenbrier, White Sulphur Springs, West Virginia.

8-10 ASME, spring meeting, Dinkler-Tutwiler Hotel, Birmingham, Alabama.

8-11 AGA distribution, motor vehicles and corrosion conference, Rice Hotel, Houston, Texas.

12 Southeastern Gas Association, round-table sales conference, Selwyn Hotel, Charlotte, North Carolina.

12 Maryland Utilities Association, annual spring business conference, Lord Baltimore Hotel, Baltimore, Maryland.

14-17 American Home Laundry Manufacturers Association, annual convention, French Lick, Indiana.

16-18 AGA sales conference on industrial and commercial gas, Jung Hotel, New Orleans, Louisiana.

16-18 University of Oklahoma Gas Measurement Short Course, Norman, Oklahoma.

24-25 Pacific Coast Gas Association, accounting section, spring conference, LaPlaya Hotel, Carmel, California.

25-26 Indiana Gas Association, annual meeting, French Lick-Sheraton Hotel, French Lick, Indiana.

29-May 1 Southern Gas Association, annual meeting, New Orleans, Louisiana.

May

5- 8 Air Conditioning and Refrigeration Institute, annual meeting, The Homestead, Hot Springs, Virginia.

6- 7 AGA residential gas section, eastern sales conference, Hotel William Penn, Pittsburgh, Pennsylvania.

6-10 National Restaurant Association convention and exposition, Navy Pier, Chicago (AGA will exhibit).

7- 9 AGA research & utilization conference, Cleveland, Ohio.

7-10 Heating, Piping and Air Conditioning Contractors National Association, annual meeting, Hotel Fontainebleau, Miami Beach, Florida.

8-10 Joint AGA-PCGA gas supply, transmission and storage conference, Mark Hopkins Hotel, San Francisco.

10 Southeastern Gas Association, emergency procedure round-table conference, Selwyn Hotel, Charlotte, North Carolina.

12-15 LPGA annual meeting, Conrad Hilton Hotel, Chicago.

19-22 Industrial Heating Equipment Association, Hot Springs, Virginia.

19-23 ASME oil and gas power conference, Kentucky Hotel, Louisville, Kentucky.

20-22 AGA mid-west regional gas sales conference, Edgewater Beach Hotel, Chicago, Illinois.

20-22 AGA chemical, engineering and manufactured gas production conference, Balmoral Hotel, Bal Harbour, Florida.

20-24 National Fire Protection Association, annual meeting, Hotel Statler, Los Angeles.

21-22 AGA industrial and commercial gas section, managing committee, Sea Island, Georgia.

21-23 Pennsylvania Gas Association, annual meeting, Pocono Manor Inn, Pocono Manor, Pennsylvania.

June

2- 5 American Gear Manufacturers Association, annual meeting, The Homestead, Hot Springs, Virginia.

2- 5 The American Society of Refrigerating Engineers, Hotel Fontainebleau, Miami Beach, Florida.

3- 5 American Management Association, general management conference, Statler Hotel, New York.

3- 5 Institute of Appliance Manufacturers, Netherland-Hilton Hotel, Cincinnati, Ohio.

4- 6 Appalachian Underground Short Course, West Virginia University, Morgantown, West Virginia.

9-13 ASME, semi-annual meeting, Sheraton-Palace Hotel, San Francisco, California.

16-21 American Society for Testing Materials, Chalfonte-Haddon Hall, Atlantic City, New Jersey.

23-25 Wisconsin Utilities Association, accounting section convention, King's Gateway Hotel, Land O'Lakes, Wisconsin.

24-25 Michigan Gas Association, Grand Hotel, Mackinac Island, Michigan.

24-27 Canadian Gas Association, Jasper Park Lodge, Jasper, Alberta, Canada.

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(Continued from Page 23)

The annual load factor of gas heating only in the Hartford area based on a minimum temperature of 4 F and 6139 normal degree days is 27.6 percent. The Algonquin contract, based on 1000 Btu per cu ft at 14.73 psi, is $4.75 per Mcf per month of maximum daily demand plus 31.5 cents per Mcf of commodity. Heating gas costs 88.34 cents per Mcf. The Tennessee contract, based on 1030 Btu per cu ft at 15.025 psi is $4.50 per Mcf of demand and 32.15 cents per Mcf commodity.

Correcting this base to the Algonquin conditions results in $4.28 per Mcf of demand and 30.6 cents per Mcf of commodity. Heating gas from Tennessee under Algonquin conditions costs 81.58 cents per Mcf. By peak shaving with propane at $1.54 per Mcf equivalent, Algonquin gas costs become 75.30 cents per Mcf and TGT gas costs become 70.69 cents per Mcf.

These might be called the bare-bone natural gas costs at the city gate for heating under the conditions stated. A necessary mark-up must be added to the costs to arrive at a selling price. This mark-up is a difficult figure to arrive at since we have not attained saturations of heating high enough to be able to use existing financial figures. In other words, unit costs come down as volume goes up. For example, in Connecticut Power Company, the total expenses, including depreciation and taxes but excluding amortization of conversion expense and natural gas, has fallen from an average of $1.80 per Mcf in 1954 to $1.05 in 1956. Our present saturation of kitchen heating is 13.8 percent and house heating is 7.9 percent. What will these costs be when the saturations are 20 percent? And, more specifically what would this cost be for heating gas only? Such an answer can only be obtained from a cost study based on an estimated projected year.

Speaking broadly of the gas industry in New England, I believe that it should not ask for any advance in gas prices now. The industry must get out and sell as much of the market as possible, not only space heating but industrial and commercial loads as well.

Don't overlook the interruptible and seasonal loads, either. If and when it becomes necessary to ask for rate relief, put as much of the increase in the lower blocks of the rate as possible. There is considerably greater disparity in costs and rates here than in the house heating area.

Acknowledgment

This article was developed from a presentation made at the New England Gas Association's Gas Utility Managers Conference, Boston, February, 1957.

★ ★ ★

Julius Klein (left), president of Gas Appliance Manufacturers Association, receives citation in behalf of GAMA from Gordon M. Jones, past president of Pennsylvania Gas Association, during PGA mid-winter sales conference in Philadelphia.

Pennsylvania Gas Utilities Pay Tribute to GAMA

Pennsylvania Gas Association, in public appreciation of the work done by the Gas Appliance Manufacturers Association, has presented a citation award to Julius Klein, president of GAMA. The work done by that organization in the continued improvement and development of modern gas appliances, PGA feels, has been instrumental in the spectacular progress of the gas industry.

The award was made during the mid-winter sales conference of the Pennsylvania utility group. Gordon M. Jones, past president of the association, stated that the association's sales personnel "feel that too little has been done to publicly acclaim the outstanding contribution to the growth and success of the gas industry which has been made by the individuals and the companies who form the various divisions of GAMA."

Brooklyn Borough Smashes Automobile Safety Record

In line with the national safe-driving campaign, Brooklyn Borough Gas Company kept the number of preventable automobile accidents of that company down to three during the year of 1956. In recognition of this accomplishment, each of the 84 authorized drivers of Brooklyn Borough Gas Company was presented with a $25 United States Government Savings Bond. Walter M. Jeffords, Jr., president, said that the three accidents were of a minor nature and had caused no physical injuries. The first accident occurred in January, the second in July and the third in November.

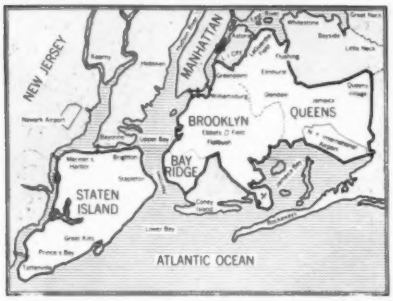
Oklahoma's Management Cited for Excellence

Oklahoma Natural Gas Company has received a citation of "Excellent Management" from the American Institute of Management. H. A. Eddins, president, accepted the award for the company.

The award, given to a number of outstanding American and Canadian companies, is based upon searching evaluation of the recipients' management policies, practices, and accomplishments in such areas as economic functions, corporate structure, health of earnings, service to stockowners, research and development.

Brooklyn Union Gas Merger Completed

The Brooklyn Union Gas Company has consolidated Kings County Lighting Company and New York & Richmond Gas Company with Brooklyn Union.



The consolidation is the consummation of efforts extending over a number of years, according to John E. Heyke, president of Brooklyn Union, and represents an increase of about 20 percent in the number of customers served by the utility. Already one of the largest gas distributing companies in the nation, Brooklyn Union will now serve more than one million customers in Brooklyn, Queens, and Staten Island.

The move was approved by the Public Service Commission on December 11, 1956. Kings County Lighting Company supplied natural gas to an area of about nine and one-half square miles in the Bay Ridge section of Brooklyn. The company had about 119,200 gas meters serving a population of about 477,000.

New York & Richmond was franchised to serve all of Staten Island although only a limited amount of gas service is available in the fifth ward in the southern part of the island. An extensive construction program is under way to supply gas to this area. The population of the borough of Richmond is estimated at 206,000 and currently the company serves about 44,600 active meters.

News Notes:

Completion of the $1,400,000 natural gas conversion program at Vancouver, British Columbia, by the B. C. Electric was marked by a brief ceremony recently, when Dr. H. L. Purdy, executive vice president, turned the valve to feed the gas into the last sections of the city. In approximately four months, B. C. Electric crews have converted more than 125,000 gas appliances in the Greater Vancouver area. The average cost of the conversion program was about $20 a customer. Directing the project was North American Conversion Company.

The program for the Second Annual Appalachian Underground Corrosion Short Course to be held June 4-6 at West Virginia University in Morgantown, will include a complete introductory basic course in corrosion control fundamentals and an intermediate course for those who had the basic course in 1956. Next year a third complete advanced course is planned for those who have received the basic and intermediate courses. New on the 1957 program will be a field demonstration, utilizing many of the test procedures and techniques described in the lectures, on buried structures at a test site on the campus.

Service pin for president and general manager Guy W. Wadsworth Jr. (left) of Southern Counties Gas Company is presented by Franklin S. Wade, former Southern Counties president and now chairman of board of Southern California Gas Company. Wadsworth, 27 years with Counties, was one of 423 of the firm's employees honored for a minimum of 15 years with the company. More than 10,225 years "on the job" have been amassed by the 423 employees.

American Meter Holds Gas Measurement School

Twenty-two representatives of 15 major Eastern U. S. gas utility companies have completed American Meter Company's latest measurement school. Primary subjects discussed at the school are orifice meter measurement, automatic control, flow proving, regulation, integrating devices, and telemetering systems. H. V. Beck, American Meter chief engineer, and J. E. Gesner, sales manager of the company's Reliance Regulator Division conducted the classes.

Gas company representatives attending the school were: Holyoke Gas & Electric Company, Connecticut Power Company, Mystic Valley Gas Company, New England Electric System, Dayton Power & Light Company, Western Kentucky Gas Company, Texas Gas Transmission Company, New York State Natural Gas Company, Southern Natural Gas Company, Southeast Alabama Gas District, Okaloosa Gas District, Delaware Power & Light Company, Reading Gas Company, Chattanooga Gas Company, and United Fuel Gas Company.

SGA Employee Relations Group Holds Conference in Dallas

Wages and salaries, fringe benefits, job classifications, executive development programs, union efforts directed at gas transmission companies, educational assistance programs, and safety programs for office employees were featured discussion topics on the program of the Southern Gas Association's Employee Relations Section's third and last round-table conference for the current association year.

Ralph E. Allen, chairman of the SGA Employee Relations Section and personnel director for El Paso Natural Gas Company, served as discussion leader of the meeting held in Dallas, Texas. Attending were 38 representatives from 26 different companies.

D. A. Hardesty, incoming chairman of the Employee Relations Section and assistant vice president of Texas Illinois Natural Gas Pipeline Company, outlined the Employee Relations Section's plans for the 1957-58 association year. Highlight of the meeting was a presentation by Harold F. Taylor of Oklahoma Natural Gas Company on "Proposed Fringe Benefit Surveys."

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Men At Work

IN THE GAS UTILITY INDUSTRY

● **Ray C. Fish** has been named to the board of directors of Transcontinental Gas Pipe Line Corporation. Fish is chairman of the board of Pacific Northwest Pipeline Corporation and president of Fish Engineering Corporation.

R. C. Fish

O. F. Rogers

● **Oscar F. Rogers** has been elected vice president, operations, of North Shore Gas Company, Waukegan, Illinois.

● **Jerome P. (Jerry) Happ** has been elected vice president, sales, of North Shore Gas Company of Waukegan, Illinois. Formerly he was general sales manager of the utility.

J. P. Happ

L. E. Ingham

● **L. E. Ingham,** vice president of Texas Gas Transmission Corporation, has retired after more than 46 years in the natural gas industry. He will continue as a member of the board of directors and as a consultant to the company.

R. B. Munroe

J. J. Condon

● The Peoples Gas Light and Coke Company, Chicago, Illinois, has announced three top level promotions in the sales division. They are: **Roy B. Munroe,** manager of domestic sales, has been appointed assistant to the vice president in charge of sales; **James J. Condon,** manager of commercial sales, has been named manager of the domestic sales department succeeding Munroe, and **Vincent D. Fortunato,** assistant manager of the commercial sales department, has been named manager of that department to succeed Condon.

● The Gas Service Company of Kansas City, Missouri, has announced the appointment of **W. A. Stevens** as superintendent of the Newton, Kansas, property of the company.

● **Ralph W. Fouse,** rate expert in the utilities field, and vice president and assistant treasurer of the Brooklyn Borough Gas Company, has been named to the company's board of directors.

R. W. Fouse

Frank Swearingen

● **Frank Swearingen** has been appointed advertising promotion manager of Washington Natural Gas Company, Seattle, Washington.

Kurwin R. Boyes

Kurwin Robert Boyes, secretary of the American Gas Association since 1926, died recently at his home in New York City, at the age of 60. He joined the AGA in 1923 as assistant to the managing director and three years later was named secretary of the Association.

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TRADE NEWS OF THE GAS UTILITY INDUSTRY

New Concept in Large Forced-Air Space Heaters

A new concept of burning fuels in direct fired forced air space heaters was introduced at the annual American Society of Heating and Ventilating Engineers meeting in Chicago February 25. Developed by Dravo Corporation, the unique heating principle is incorporated in the company's 1957 "Counterflo" heaters to give increased operating efficiency through greater air-heat volumes and drastically reduced fan horsepower requirements.

Heart of the new heater is an induced draft "Pyro-Jet" burner suited for gas or combination gas/light oil firing. Instant fuel changeover is effected by a manually or thermostatically operated switch.

Fan motor requirements, based on a 75 F temperature rise, range from ½-hp up to 7½-hp, depending upon the size of the heater. Air-heat ratios range from 11,000 to 16,000 cfm per 1,000,000 Btu per hr output. Tests show the heaters, regardless of size, operate at a minimum efficiency of 80 percent.

The heaters were originally designed in 1941 for use in hard-to-heat, high ceiling open area mill and factory buildings in the northern part of the United States, and their applications have broadened to include all types of industrial and commercial buildings, warehouses, airplane hangars, garages, schools, gymnasiums, and auditoriums. Functionally, they have been adapted for process drying and heat curing operations and for tempering make-up air.

The new heater has two separate basic components. The furnace section is complete with an induced draft burner, stainless steel combustion chamber of true airfoil design, secondary heat transfer tubes of aluminized steel and electronic flame failure protection. The circulating fan section contains forwardly curved, low speed, double inlet fans.

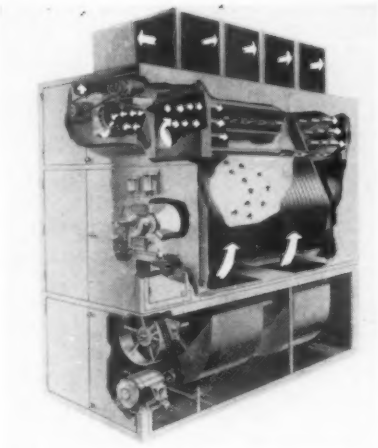
This two-part design provides extreme flexibility in matching fan requirements with heater Btu per hour output capacities, and also permits the use of low cost standard furnace assemblies for special ventilation installations, oven heating and process drying, and integration with air conditioning systems usually requiring the use of large centrifugal fans.

Robertshaw-Fulton Opens $2-Million Plant In Connecticut

Bridgeport Thermostat Division of Robertshaw-Fulton Controls Company has opened a modern $2-million manufacturing plant that more than doubles the size and output of the installation it replaces.

The 180,000-sq-ft plant, located on a 15-acre site in Milford, Connecticut, represents one of the largest manufacturing installations in the area. Complex precision instruments and components for use in industry and jet aircraft are already being produced in the modern manufacturing facility. In addition, metallic bellows and instruments employing bellows, such as automotive thermostats and temperature controls for home appliances, also are being made.

The new plant includes a special water treatment plant, complete with two settling ponds, which treats chemical waste in order to prevent pollution of local streams.



Cut away drawing of new Dravo heater shows the airfoil design of the stainless steel combustion chamber, the air flow over the surface of the chamber, and the flame travel within the chamber and through corrosion-resistant aluminized steel economizer tubes.

Case-American Tractor Companies Complete Merger

American Tractor Corporation has been consolidated into J. I. Case Company and Marc B. Rojtman, dynamic 39-year-old former president of American Tractor, has been elected to the newly created position of executive vice president and general manager. Rojtman will have authority over and responsibility for the overall operation of the newly merged company. Two other members of the former American Tractor board of directors, Mentor Kraus of Fort Wayne, Indiana, and Edward Elliott of New York City have been elected to the board of directors of Case.

M. B. Rojtman

Some of the major Case policy moves for 1957 as outlined by Rojtman include an aggressive sales program and a strong emphasis on engineering and development of new products.

Trade News Notes

The formation of a European subsidiary known as Selas Corporation of America, European Division S. A., with headquarters in Geneva, Switzerland, has been announced. The new firm, which will serve industries throughout Western Europe, will be headed by W. Jack Hofmann, general manager, with A. E. Baltus, who has been general European representative for Selas the past seven years, as sales manager.

W. J. Hofmann

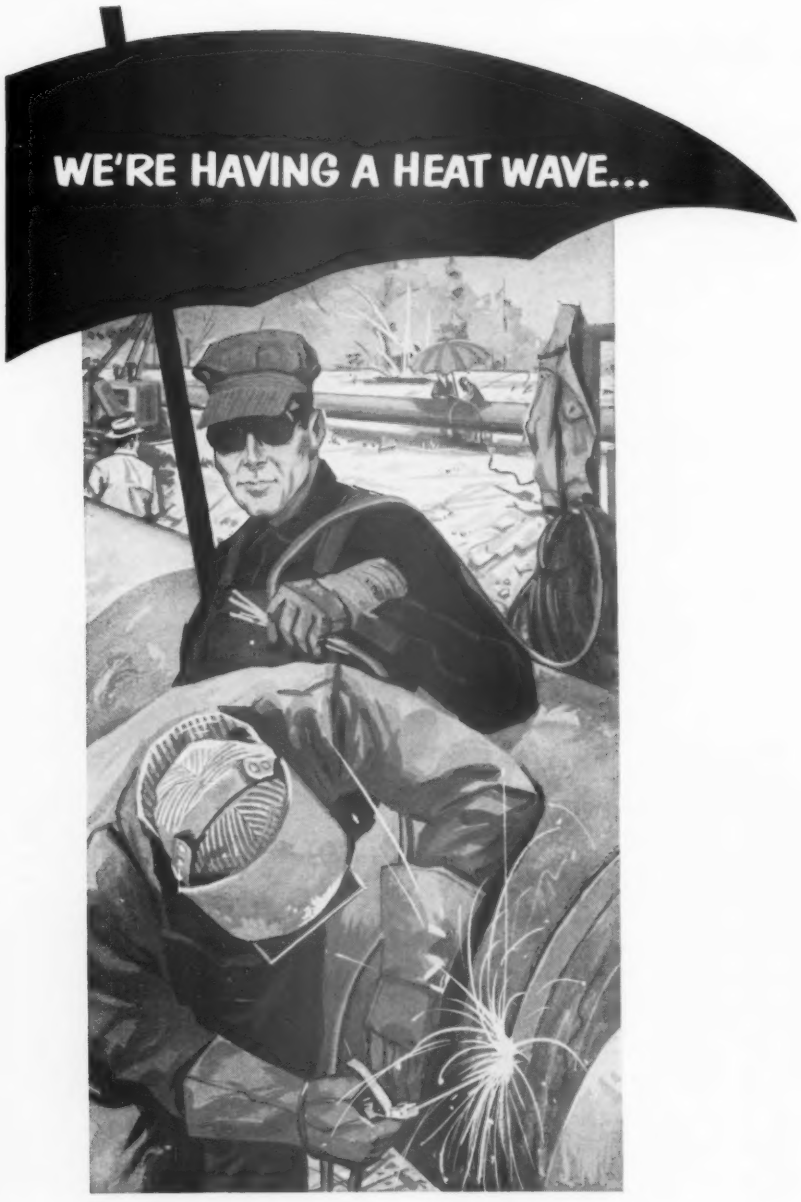
Taco Heaters Incorporated, Cranston, Rhode Island, has announced the following changes and additions in its sales organization: Peter G. Leddy, formerly vice president-finance, has been appointed vice president and manager of marketing; Robert H. Chaffee has been appointed eastern regional sales manager; Wallace E. Johnson has been appointed western regional sales manager; Vincent F. Callahan has been transferred from Connecticut to the Minneapolis territory; Winthrop H. Guptill, Jr. is to replace Callahan in the Connecticut territory; Walter Luger has been added to the New Jersey territory and Sal P. Ragonese has been added to the New York territory.

Hills-McCanna Company, Chicago, has announced the following appointments in the pump sales department: P. R. McCloud as product sales manager, and H. P. Orlebeke as chief engineer. Hills-McCanna has also announced the appointment of The Burhans-Sharpe Company of Seattle, Washington, as exclusive representative for their line of chemical metering and proportioning pumps and force-feed lubricators in the states of Oregon and Washington.

GAMA adds members to four divisions. Addition of one member to each of four divisions of the Gas Appliance Manufacturers Association has been announced by Harold Massey, managing director. They are: Boston Stove Foundry Company of Reading, Massachusetts, a range manufacturer; Altorfer Bros. Company of East Peoria, Illinois, manufacturer of gas clothes dryers; North Coast Manufacturing Corporation of Portland, Oregon, producer of gas-fired furnaces; and the industrial division of the Minneapolis-Honeywell Regulator Company, headquartered at Philadelphia.

The Gas Equipment Manufacturers Committee has elected C. Benson Dushane of the American Meter Company as its chairman. The committee, made up of manufacturers whose products ordinarily are not sold directly to consumers, conducts the "GEM" program to advertise the advantages of gas appliances and household gas service. Other officers of the committee named are: Vice chairman, K. R. D. Wolfe of the Fisher Governor Company; operating committee members, G. T. Bowman, Rockwell Manufacturing Company; C. H. Abbott, Sprague Meter Company, and Carl N. Brown, U. S. Pipe & Foundry Company.

Gas-fired water heater for the rapidly expanding swimming pool market has been added to the Burkay line of the Permaglas Division, A. O. Smith Corporation, Kankakee, Illinois. The number of permanent swimming pool installations 15 by 30 ft or larger has quadrupled in the last five years, and a high percent of the 30,000 pools built in 1956 had heating systems installed. Smith's newest Burkay heater with a weather-resistant outer shell completely enclosing the controls, has inputs from 110,000 to 420,000 Btu per hour. The swimming pool heater models are sized for pools from 10,000 to 40,000-gal capacity. Multiple installations are used for larger pools.



...but neither summer sun nor winter snow stops Transco's search for new and profitable markets for natural gas. During 1956, Transco delivered record quantities of gas to heat-hungry markets. This year, look to Transco for a real heat wave... a wave to increase natural gas movement—to bring heat for warmth and fuel for power to our best potential markets... the places where the most people are.

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Trade Personals

● **Eugene D. Rouse** and **Jack S. Coldren** have been named sales representatives for the Garland, Texas, and Fullerton, California, sales district of American Meter Company, after completing a six-month company training school.

● Recent new appointments and promotions announced by Day & Night Manufacturing Company, Monrovia, California, include: **Frank R. Spratt,** former California regional sales manager, to assistant general sales manager; and **Craig Stirewalt** to replace Spratt as California regional sales manager.

F. R. Spratt

H. M. Love, Jr.

● Royston Laboratories, Inc., has announced the appointment of **Harrison M. Love, Jr.** as representative in the southeastern states, assisting the Atlantic regional sales manager, **E. M. Steinmann.** Love will handle Roskote mastics and other pipeline products as well as industrial protective coatings.

P. S. Hammond

Ted Candee

● The Siegler Corporation, Chicago and Pasadena, California, has announced that

Robert Grossman

Paul S. Hammond, vice president of Siegler's Holly Manufacturing Company division, will also become vice president and treasurer of Siegler's General Water Heater Corporation division. **Ted Candee** has been made vice president in charge of manufacturing for Holly Manufacturing Company and General Water Heater Corporation, and **Robert Grossman,** sales manager of Holly Manufacturing Company, has been made vice president and general sales manager for that company.

● Ford, Bacon & Davis, Inc. has announced the election of **C. C. Whittelsey** as president, succeeding **E. S. Coldwell,** who will actively continue as chairman of the board of directors. Whittelsey was formerly executive vice president.

● **James C. Patterson,** manager of Carrier Corporation's unit heater department, retired in December after 20 years of service with the pioneer air conditioning firm. Patterson was instrumental in development of mobile home air conditioning

NEW LITERATURE

FOR THE GAS UTILITY INDUSTRY

For more information on items described here in brief, use the handy reply card and circle the corresponding numbers

"Meter Tips and Shop Tricks," a house organ published by Lancaster Meter Parts Company, has been so popular with gas meter repair shops that it is being expanded to four pages. The magazine is punched to fit Lancaster's looseleaf catalog on diaphragm and other meter replacement parts, and features interesting and helpful meter shop tricks with humorous cartoon illustrations. Back page of each issue is devoted to a chapter from "Meter Shop Repair Manual" written by Ed Gilmore, Lancaster's chief engineer. *Lancaster Meter Parts Company.*

CIRCLE (41) ON THE REPLY CARD

Fisher Utility Catalog. The new 1957 utility catalog has been announced by Fisher Research Laboratory, Inc. of Palo Alto, California. The new catalog shows all Fisher items of equipment that are of interest to utilities, and includes many new instruments shown for the first time. *Fisher Research Laboratory, Inc.*

CIRCLE (42) ON THE REPLY CARD

The National Fire Codes. A compilation of 174 fire safety standards as developed by the National Fire Protection Association, has just been published by the NFPA in a revised six-volume 1956 edition. The six new volumes by title and content are: Volume I, Flammable Liquids and Gases; Volume II, Combustible Solids, Dusts, Chemicals and Explosives; Volume III, Building Construction and Equipment; Volume IV, Extinguishing Equipment; Volume V, Electrical; Volume VI, Transportation and Miscellaneous.

Incorporated in the 1956 Volumes are 32 new or revised fire safety standards adopted at the 1956 NFPA Annual Meeting. These standards include all amendments approved by the NFPA board of directors through July 30, 1956. *The National Fire Codes, $6.00 per volume.*

CIRCLE (43) ON THE REPLY CARD

Flame Characteristics Study. The results of an American Gas Association PAR-sponsored research project at the Bureau of Mines have been issued as a 200-page report entitled "Fundamental Flashback, Blowoff, and Yellow-Tip Limits of Fuel Gas-Air Mixtures." Authored by Joseph Grumer, Margaret E. Harris, and Valeria R. Rowe, of the Division of Explosives Technology, Pittsburgh, the report summarizes current theoretical knowledge and experimental data pertaining to flame characteristics of fuels likely to be used in the lines of gas distributors. The study is a compilation of generally applicable data which may become a part of the academic training of future gas engineers, and serve to stimulate and guide applied research. *Report of Investigations 5225 American Gas Association.*

CIRCLE (44) ON THE REPLY CARD

Horizontal Earth Boring Machines. Hydrauger Corporation, Ltd., pioneer manufacturer of horizontal earth boring machines, has prepared a new 16-page illustrated booklet which includes the complete new Hydrauger line of machines, interesting field operation photos, and views showing embankment drainage and pipeline installation. *Hydrauger Corporation, Ltd.*

CIRCLE (45) ON THE REPLY CARD

Poster Frames. Posters, Inc. has developed a new, light weight aluminum frame that compares favorably with cardboard in cost and can be used to hold from 12 to 52 messages. When one poster has served its purpose, at the end of a month, a week or even a day, the top poster can be torn out just like a calendar, and the new message is already in place.

Posters are being used by a number of utilities in appliance dealer's stores, to stimulate the customer to buy and the salesman to sell. Used to convey messages of many kinds—from news posters in store windows to "point-of-sale" advertising in retail stores, posters are now also becoming recognized as one of the finest methods of employee communication. *Posters, Inc.*

CIRCLE (46) ON THE REPLY CARD

Portable Elevating Trucks. A catalog describing the completely new, completely redesigned American Safeway Portable Elevating Trucks is now available from the American Pulley Company. The complete line of manually operated trucks has been redesigned from the floor up, and includes features which provide a vast improvement over other trucks in the same weight range. The line includes fork and platform elevating trucks, drum stackers, and straddle models. Maximum loads range from 1000 lb for the pedal-operated models to 1500 lb for the battery-powered type. Standard models lift as high as 96 in. *Catalog HE-56, American Pulley Company.*

CIRCLE (47) ON THE REPLY CARD

Lubricated Plug Valve Catalog. New 28-page catalog shows 100 percent pipe area, venturi, round port, and diamond port Homestead lubricated plug valves in a variety of metals for 150 lb steam working pressure, 200-lb oil-water-gas, and ASA 150 and 300-lb classes. Complete with engineering dimensions, this catalog also shows different types of power operators for valves, in addition to complete lines of lever operated, and worm and gear operated valves. *Section 5 of Reference Book 39, Homestead Valve Manufacturing Company.*

CIRCLE (48) ON THE REPLY CARD

New Pipe Protection Movie. "All Holes Barred," a new 20-minute sound and color movie showing correct application of "Scotchrap" vinyl pipe insulating tape for corrosion prevention, has been announced by Minnesota Mining and Manufacturing Company. Prepared as a training film for free showing to workmen using vinyl pipe insulating tape, the new film is available through 3M branch offices and salesmen. The movie presents corrosion principles in a very elementary manner with cartoon characters dramatizing the effect of electrolysis on unprotected and faultily protected pipe. Step-by-step sequences show proven methods of insulating couplings, street "T" fittings, weld joints, elbows, and straight sections of pipe. The use of taping machines and short-cuts for hand wrapping tape are also illustrated. *Minnesota Mining and Manufacturing Company.*

CIRCLE (49) ON THE REPLY CARD

Fluor Research. New 12-page, two-color bulletin describes Fluor research facilities now available to industry on a contract basis for the first time in the firm's 66-year history. Services offered by this experienced outside research staff are explained, accompanied by case histories of recent research and development projects. *Advertising Department, The Fluor Corporation, Ltd.*

CIRCLE (50) ON THE REPLY CARD

AMA Catalog. The 1956-57 edition of the American Management Association Management Bookshelf, a complete catalog of the AMA publications and films, has just been released to the AMA membership. Copies are available at no cost to any interested manager writing on his organization stationery to *Publication Service, American Management Association.*

CIRCLE (51) ON THE REPLY CARD

Mechanized Heat Treating for Modern Plant Automation. A new bulletin, explaining the economic features of completely mechanized heat treat lines, has been published by Surface Combustion Corporation. Twenty-four basic furnace mechanisms are shown with isometric drawings. Photos and diagrams illustrate the steps to be used in building automated lines to insure better end product quality with absolute accuracy. *Bulletin SC-176, Surface Combustion Corporation.*

CIRCLE (52) ON THE REPLY CARD

Mini-Pilot 200. A bulletin describing new gas pilot development, "Mini-Pilot 200," for space heaters, water heaters, and other large home appliances is available from Robertshaw-Fulton Controls Company. The Mini-Pilot 200 is a universal pilot for all gases, and has a high millivoltage output for efficient operation with safety shut-off devices. It is non-aerated as insurance against pilot failures due to linting.

Bulletin GS-92, Grayson Controls Division, Robertshaw-Fulton Controls Company.

CIRCLE (53) ON THE REPLY CARD

Gas Conversion Burners. A bulletin describing line of multiple jet rectangular gas conversion burners ranging from 50,000 Btu per hr to 2,100,000 Btu per hr is offered by the Barber Manufacturing Company. Bulletin lists specifications, dimensions, approximate shipping weights and unique features of various models in this line of burners. *Barber Manufacturing Company.*

CIRCLE (54) ON THE REPLY CARD

standard of the industry

in the Mid-Continent area

The huge, ultra modern Lone Star Steel plant was built primarily to serve the busy Mid-Continent area . . but week after week, pipe orders come in for tons of Lone Star API line pipe, casing and tubing to be used in distant territory.

From mining of the ore through Lone Star's precision pipe mills..Lone Star's API pipe quality is controlled in every step of manufacture. Lone Star line pipe has uniform wall thickness and roundness, is easy to field weld and easy to bend.

Neighbor, wherever you are, specify Lone Star and we both get a good deal.

Lone Star STEEL COMPANY

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New Literature

Indicating Switch. Barton Instrument Corporation of Los Angeles has announced a new 4-page two-color bulletin describing the Model 211 Indicating Switch. The differential pressure switch is suitable for high pressures, but still responsive to small pressure differentials. It will actuate an audible or visual alarm, control pumps, or other electrical apparatus, when fluid flow or liquid level, as measured by differential pressure, falls outside predetermined limits. *Bulletin 211-1 Barton Instrument Corporation.*

CIRCLE (55) ON THE REPLY CARD

Gas Equipment Installation Standards. Information Letter No. 70A, recently released by the Industrial and Commercial Gas Section, covers "AGA Recommended Good Practice Requirements For Installation of Gas Equipment on Industrial and Commercial Premises," which are not covered by American Standard "Installation of Gas Piping and Gas Appliances in Buildings," ASA Z21.30 — 1954, and American Standard "Requirements for Installation of Gas Equipment in Large Boilers," ASA Z21.33 — 1950. Letter No. 70A supplements Information Letter No. 70 — July, 1955, and is intended to serve as the second portion of an American Standard of which No. 70 will be the first part. The letter includes recommendations for the selection of suitable gas equipment and the fundamental standards to be observed during the installation of equipment to assure safety and satisfactory performance. Valuable to industrial and commercial gas men, it sets forth the areas of responsibility for the installation of equipment. Other sections covered are: Location of equipment with recommendations for flue and vent connectors when required; requirements for connections to building piping; air requirements of equipment to be installed, and maintenance of equipment covering burners and pilots, flame safeguard, auxiliary devices, regulators, zero governors and piping. *Information Letter No. 70A, Industrial and Commercial Gas Section, AGA.*

CIRCLE (56) ON THE REPLY CARD

Safe Operation of Gas Room Heaters is covered in a new American Standard, Z21.11. Specifications represent basic requirements for safe operation, substantial and durable construction and acceptable performance by gas-fired room heaters. American Gas Association began working through the ASA to establish approval in 1930. AGA is urging all manufacturers of this type of heater to make their product in accordance with the new standard in order to qualify for the AGA insignia. Bulletin available from *American Standards Association.*

CIRCLE (57) ON THE REPLY CARD

Radio-TV Advertising Materials. New radio and television commercials for local sponsorship by gas range manufacturers, distributors and utilities are available from Robertshaw-Fulton Controls Company. Both radio and TV commercials feature top burner heat control, the "gas top burner with the Robertshaw brain."

For radio use, a 12-in. recording containing 20 and 60-second commercials is offered free. Three animated TV commercials, 10, 20 and 60-seconds, are available on individual reels, with sound: $15.00 a set of three. *Advertising Department, Robertshaw-Fulton Controls Company.*

CIRCLE (58) ON THE REPLY CARD

Sherman Equipment "On-the-Job" While Other Machines Stand Idle

The Contractor: The Webster Company, St. Paul, Minn.

The Job: Install an automatic lawn sprinkler system for a new school.

The Problem: Heavy rains which threatened to prevent completion of the job on schedule. Trenching machines clogged up and track-type dozers tore up the rough graded area.

The Solution: A lightweight Sherman back-hoe for the trenching with the ability to push itself along the ground with its dipstick. For backfilling and backgrading, the Sherman AJ 25 Loader on the dependable Fordson Major Tractor is used. Because of its mounting and leverage design, it transfers more weight to the big driving wheels of the tractor with resulting traction advantage. Easy steering is assured by the Sherman Power Steering unit.

Actually, the Webster Company has found its Sherman equipment profitable even on a rental basis where operators can be expected to give a rig all the abuse it will stand. Rugged, heavy-duty construction is a prominent feature of all Sherman Power Diggers, Loaders, Fork Lifts and other equipment. See them in action soon at your local Ford Tractor Dealer or write for Bulletin No. 3160.

*Manufactured for Sherman Products, Inc., by Johnson Hydraulic Equipment Company, Minneapolis, Minnesota

†Designed, Engineered and Manufactured jointly by Sherman Products, Inc., Royal Oak, Michigan. Wain-Roy Corporation, Hubbardston, Mass.

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SHERMAN MAJOR DIGGER-LOADER COMBINATION performs a great many different jobs for the city of Dearborn, Michigan. The unit is used to dig water main taps and sewer sections, to install fire hydrants, to load and backfill and to do many miscellaneous jobs.

Sherman

PRODUCTS, INC.

ROYAL OAK, MICHIGAN

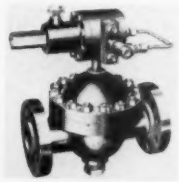
POWER DIGGERS† • FRONT END LOADERS* • FORK LIFTS

Sherman SP Products

NEW EQUIPMENT
FOR THE GAS UTILITY INDUSTRY

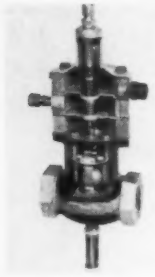
For more information on items described here in brief, use the handy reply card and circle the corresponding numbers

Relief Valve. Fisher Governor Company, Marshalltown, Iowa, has announced a new relief valve in which the main valve has only one moving part, the rubber diaphragm, which flexes to open or close the valve. Known as the "Dia-Grid," this pilot operated relief valve provides positive shut-off operation, is rugged, compact, accurate and easy to maintain. Available in 2, 4, 6 and 8-in. connections with flange ratings of 150, 300, and 600 lb. One pilot is available for use with the Dia-Grid for safety relief service at compressor, town border, and district regulator stations. It can be adjusted for relief ranges from 10 to 600 psi. *Fisher Governor Company.*



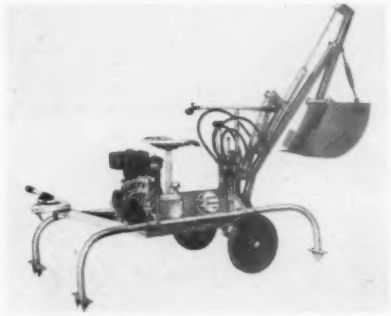
CIRCLE (1) ON THE REPLY CARD

Safety Shut-Off Valve. A new gas safety shut-off valve designed to protect against dangers of leaking gas has been announced by Handley-Brown Heater Company. Sold under the name of Poly-Trol, this new multi-purpose valve automatically shuts gas off when a dangerous condition exists such as created by a tornado, cyclonic wind, or bombing. The Poly-Trol gas safety shut-off valves are installed between the gas service and meter. When the valve senses a dangerous condition, it shuts off the gas and remains shut until reset by a serviceman. The valves will be available in ¾, 1 and 2-in. sizes. *Handley-Brown Heater Company.*



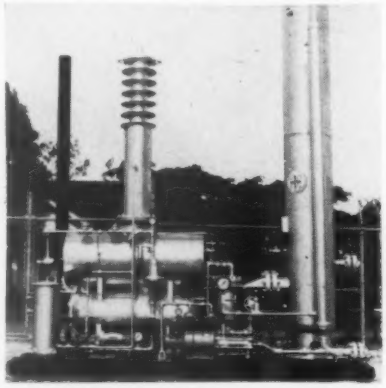
CIRCLE (2) ON THE REPLY CARD

Portable, Powered Backhoe. The Charles Machine Works Inc. has developed a low cost, portable, powered backhoe designed to eliminate hand digging. The new machine is capable of digging to a depth of 5 ft for trenches, bell holes, and excavations. The Ditch-Witch backhoe is a trailer unit and may be towed behind a car at normal road speeds; it weighs 500 lb, and has its own complete gasoline power unit and hydraulic system. *The Charles Machine Works, Inc.*



CIRCLE (3) ON THE REPLY CARD

Glycol Type Gas Dehydrators. Delta Tank Manufacturing Company, Inc., has developed a new line of glycol type gas dehydrators with processing capacities ranging from 1,700,000 to more than 60,000,000 standard cu ft of gas daily. The 42 dehydrators in the new line are designed to reduce water vapor content of natural gas to less than seven pounds per standard Mcf or depress the water vapor dew point 65 deg. whichever criterion is reached first. Using Triethyleneglycol as the absorbant, the new dehydrators are completely automatic. *Delta Tank Manufacturing Company, Inc.*



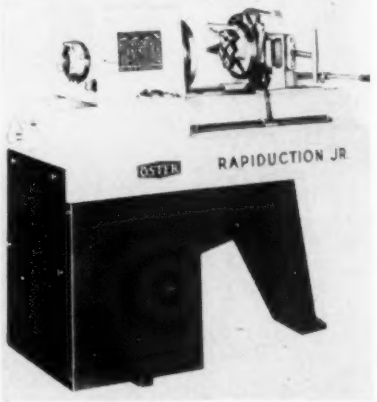
CIRCLE (4) ON THE REPLY CARD

MEN OF FORESIGHT READ NEW EQUIPMENT
MEN OF PROGRESS READ ADVERTISEMENTS
MEN OF ACTION USE READER SERVICE CARDS

Degreaser Spray. Grease, oil, carbon, tar, gums, and similar difficult-to-remove substances can now be easily, quickly, and safely removed by a new aerosol degreaser that has been designed for use on all types of machinery and electrical equipment by Stewart-Hall Chemical Corporation of Mount Vernon, New York. The degreaser spray, ZIPP, is excellent for cleaning motors and other electrical equipment, oily machinery, and other mobile equipment. It will remove greasy stains from painted surfaces, and concrete floors. It dries rapidly, leaving no film or vapor; will not short electrical equipment, is non-corrosive and non-flammable, and is safe for painted surfaces. *Stewart-Hall Chemical Corporation.*

CIRCLE (5) ON THE REPLY CARD

Threading Machines. A new line of threading machines is now being offered by The Oster Manufacturing Company of Wickliffe (Cleveland), Ohio for specific requirements. Known as the "Rapiduction Jr." this line is comprised of four machines of the same basic design but with different types of die-heads and workholders that permit the selection of the most suitable machine for each individual user's needs. Model No. 792, primarily a pipe threading machine of ⅛-in. to 2-in. capacity, will also thread bolts and rods from ¼-in. to 2-in. diameter. A new type gripping chuck known as the "Power-Matic" is standard equipment on the No. 792. Chuck gripping jaws have neoprene bonded, replaceable inserts which, due to their rocking action, grip securely in either right or left hand operation. Model No. 792-R, equipped with a manually operated revolving, radial-type die-head and open-type vise which holds the work stationary, is available for jobs where it is necessary to thread pipe, rods, or bolts after bending. Two other models, No. 791-A and 792-A, primarily bolt and rod threading machines, designed with semi-automatic, revolving die-heads of the radial type. *The Oster Manufacturing Company.*



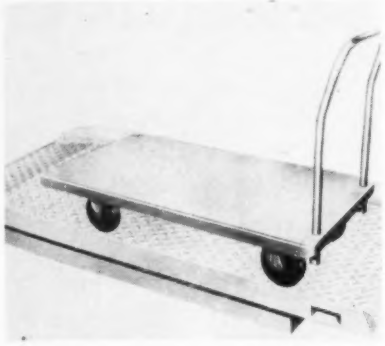
CIRCLE (6) ON THE REPLY CARD

Boring speeds of the latest Hydrauger horizontal earth boring machines have been increased as much as 40 percent as the result of re-designing and incorporation of the latest high-torque (high power) Ingersoll-Rand multi-vane air motors. The special motor has been built to bore and cut through toughest tree roots encountered while boring underground for pipe and conduit installation; and for soil drainage. The straight, open hole produced by the Hydrauger allows the installation of many kinds of pipe; even the new asbestos-cement types with O-ring couplings are easily snubbed into place. *Hydrauger Corporation, Ltd.*

CIRCLE (7) ON THE REPLY CARD

Diaphragm Control Valves. Black, Sivalls & Bryson, Inc., has introduced the "Super 70 Series" of control valves which include a new top-works, redesigned valve body and an all-metal float ring seal. The top-works features a new moulded diaphragm for uniform thrust over full valve travel, pressed steel cases for maximum strength with minimum weight, and a precision - calibrated single spring. Iridited and cadmium plated for corrosion resistance, the topworks is available in direct or reverse acting styles and in four sizes. *Black, Sivalls & Bryson, Inc.*

CIRCLE (8) ON THE REPLY CARD



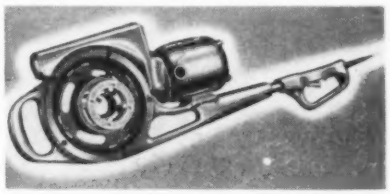
Aluminum Hand Trucks and Dock Boards. Voltz Brothers, Inc., Chicago, makers of wagons and truck bodies since 1869, have announced the new line of Met-L-Ite aluminum hand trucks and dock boards. It embodys a number of new construction features to make the handling of materials easier, safer, and more economical. Met-L-Ite hand trucks have a formed aluminum deck with rounded corners and an adjustable wheelbase for a short or long turning radius. This radius adjustment permits the truck to turn on its own axis. Having greater rigidity and longer life, the deck boards have safety tread plate, rounded extruded curbings with hand grips and beveled edges for easier approaches. *Voltz Brothers, Inc.*

CIRCLE (9) ON THE REPLY CARD

Aluminum Alloy Storage System. The A-138 Alcoa aluminum alloy storage system is now being marketed by Ruud Manufacturing Company, to help solve various storage problems in installing or maintaining hot water supply in commercial applications. The system consists of a 115 gal aluminum alloy tank, mounted on a 2½-in. base and enclosed with heavy insulation within a steel jacket that has a baked enamel finish. It has tappings located for handy connections in vertical installations, and can be factory or field equipped with the Ruud two-temperature kit so both 140 and 180-deg water can be widthdrawn simultaneously. The A-138 can be secured as a "package" with the new Ruud AS 20-80 Sanimaster gas water heater. The manufacturer then supplies all circulating pipe connections and fittings. It thus can augment the small water capacity of this new high input commercial water heater. *Ruud Manufacturing Company.*

CIRCLE (10) ON THE REPLY CARD

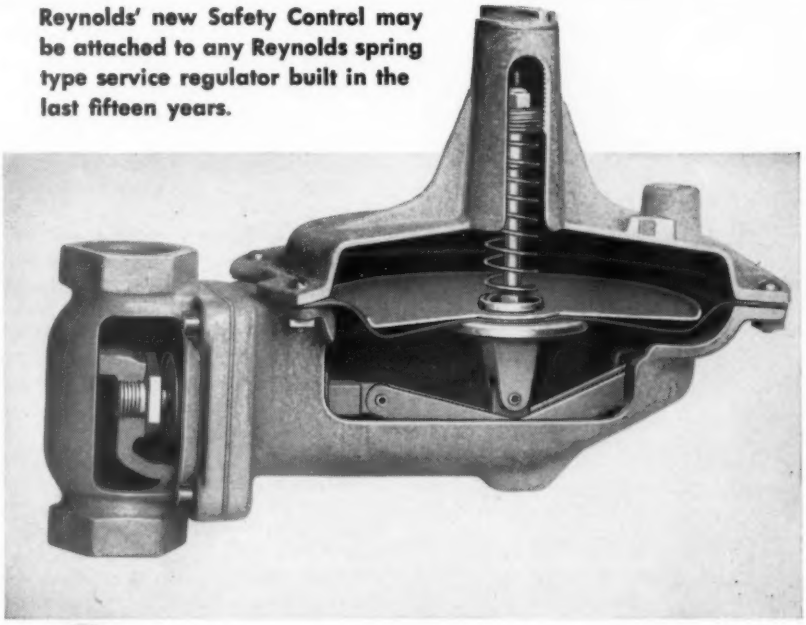
Power Drive. A new improved power drive has been announced by The Toledo Pipe Threading Machine Company. Known as the Toledo No. 68, this portable power drive, used for pulling, lifting, threading and turning on a wide variety of jobs, has been completely redesigned for easier operation and longer life. *Toledo Pipe Threading Machine Company.*



CIRCLE (11) ON THE REPLY CARD

Reynolds OFFERS A NEW PERFECTED SAFETY CONTROL FOR ALL SERVICE REGULATORS

Reynolds' new Safety Control may be attached to any Reynolds spring type service regulator built in the last fifteen years.



GAS CONTROL SINCE 1892

* **Prevent regulator from falling in a wide open position, thus limiting the amount of gas the safety seal has to pass.**
* **Enable the gas company to set the regulator for a certain demand and if a customer increases that, his outlet pressure would drop which would cause him to call the company and they can find out what his real demands are.**

REYNOLDS GAS REGULATOR CO.
ANDERSON, INDIANA

WHAT WILL YOUR PIPE LINES LOOK LIKE 10 YEARS FROM NOW ?

In case after case, lines protected with TAPECOAT have been dug up after more than 10 years of service *with no signs of deterioration on the pipe surfaces uncovered.* That's why TAPECOAT coal tar coating is specified by those who realize that continuing protection is the *first* consideration.

Since 1941, this quality coal tar coating in handy tape form has demonstrated its ability to withstand corrosion year after year, above and below ground, on pipe, pipe joints, couplings and other vulnerable surfaces.

Why gamble with "unknown" protection? By using TAPECOAT, you'll be sure to have the quality protection you need for long service life without costly maintenance and replacement.

Write for brochure and prices

The TAPECOAT® Company

Originators of Coal Tar Coating in Tape Form

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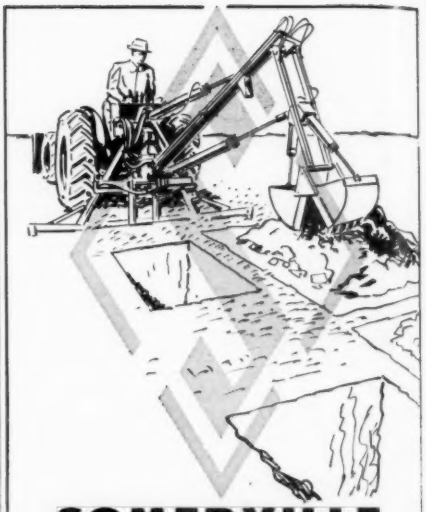

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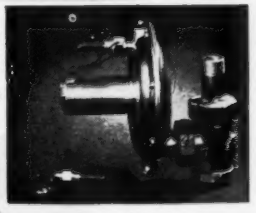
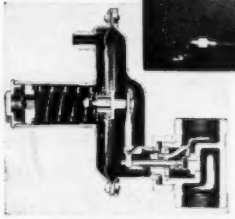
UNIVERSAL

GAS SERVICE REGULATORS FOR CONVERSION OR PRESSURE ELEVATION

A REGUATOR, BREATHER VENT AND CATHODIC INSULATOR IN ONE PACKAGED UNIT





U. S. Patent No. 2,577,480. Other Patents Pending.

TYPE 51-R FOR EVERY INSTALLATION

EXCLUSIVE FEATURES NOT FOUND ELSEWHERE

Exceptionally high relieving capacity obtained by new type internal relief valve. Remarkable by-pass check valve prevents over-shooting of low pressure and damage to meter.

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UNIVERSAL

CONTROLS CORPORATION
P. O. Box 13122
Walnut Hill Sta. — Dallas, Texas

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Circle code number corresponding to NEW EQUIPMENT or LITERATURE items following in this issue.

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